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No. 5 ORIGINAL.

In the Supreme Court of the United States,

OCTOBER TERM, 1906.

The State of Georgia, by its Attorney General, John C. Hart, Plaintiff,

vs.

The Tennessee Copper Co. and the Ducktown Sulphur Copper and Iron Co., Limited, Defendants.

IN EQUITY.

Brief and Argument of the Defendant Ducktown Sulphur, Copper and Iron Company, Limited, on the Final Hearing.

JAS. G. PARKS, Attorney,
Cleveland, Tenn.

GAULT-OGDEN CO., KNOXVILLE, TENN.

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STATEMENT.

This suit was brought by the State of Georgia, as plaintiff, against the Tennessee Copper Company and the Ducktown Sulphur, Copper & Iron Company, Limited, as defendants. The original bill was filed October 23, 1905, subpœna was awarded, returnable January 15, 1906, and a rule was entered, returnable December 4, 1905, requiring the defendants to show cause why a preliminary restraining order should not be granted.

The defendants filed separate demurrers to the bill and made answer to the rule to show cause.

In April, 1906, argument was heard on the demurrers and on the rule to show cause, and at the October term, 1906, an order thereon was made by the Court, of which the following is a copy:

> "On consideration of the demurrer herein, and of the argument of counsel thereupon had, it is now and here ordered that said demurrer be, and the same is hereby overruled without prejudice to any question; and leave is hereby granted to the

defendants to answer; and the parties are ruled to come to issue on or before November 19, 1906.

It is further ordered that the complainant herein close its proof on or before December 19, 1906, and the defendants on or before January 18, 1907, and the cause is set for final hearing on Monday, February 25, 1907.

It is further ordered that leave be, and the same is hereby granted to use the affidavits now on file as proof, as counsel may be advised.

It is further ordered that the motion for a temporary restraining order pending the final hearing be, and the same is hereby overruled."

This defendant, under the leave granted, filed its answer to the bill on November 19, 1906.

By written stipulation, signed by counsel of all the parties and filed with the Clerk, it was agreed to submit the cause to the Court upon the evidence used on the preliminary hearing, and that no further proof be taken.

AVERMENTS IN THE BILL.

It is charged in the bill that the defendants are engaged in the mining and smelting of copper ores in Polk county, Tennessee, adjacent to the territory of the plaintiff; that the smoke, fumes and gases arising from the smelting operations of the defendants are carried by the air-currents over and upon the territory of the plaintiff, where, it is alleged, they have caused, and are causing, injury to timber, vegetation, etc.

While considerable space is devoted to allegations of injury to the property of citizens living in certain counties that are mentioned, the gist of the alleged injury to the State of Georgia, in its corporate or sovereign capacity, may be summarized as follows:

"1. That the plaintiff is the original and ultimate proprietor of all lands within its territory, including those in the counties named in the bill. (*Bill, par. 2.*)

"2. That by reason of the alleged injury to the property of individual citizens within the designated area, the taxable value of such property has been lessened and, therefore, the State's income and revenues diminished.

(*Bill, par.* 13.)

"3. That the State is the owner in fee of all public roads and highways within its borders; that by reason of the alleged injury and destruction of vegetation, moisture is not held or retained by the soil in the normal way; and that, as a result thereof, the rainfall runs off rapidly, causing freshets and overflows in the mountain streams, and washing holes, ruts and gullies in the public roads, greatly to their injury."

(*Bill, par.* 8 *and* 11.)

In addition to these matters it is also averred that the health of the citizens of Georgia in the designated area has been, and will still further be seriously injured and impaired by the conditions complained of.

DEMURRER TO THE BILL.

As above stated, this defendant demurred to the bill on the following grounds:

"1. The Court has no jurisdiction of either the parties, or the subject-matter, because,

"(a.) The facts stated show that no property or property rights of the State of Georgia are in any manner injured or affected by the matters alleged, and that this is not a controversy arising directly between said State and the defendants, but, at most, is one in which the State has only a remote or contingent interest.

"(b.) The facts show that this is not a controversy arising directly between the State of Georgia and the defendants; that said State, in fact, is simply lending its name to prosecute the suit for and in behalf of a few of its citizens, who reside in a designated integral portion of its territory,

and that the State at large, in its corporate or sovereign capacity, has no direct interest herein.

"2. The facts are not such as to entitle the plaintiff to the relief sought, it not appearing therefrom that the alleged injury to its citizens is irreparable, and that a full, adequate and complete remedy may not be had at law."

The demurrer being overruled without prejudice to any question, this defendant prays to be permitted to rely upon each and every question raised thereunder. In so doing it also begs to be permitted to rely upon its brief heretofore filed in connection with the present one.

ARGUMENT ON DEMURRER.

First. We respectfully submit that this is not a controversy in which the State of Georgia, in its corporate or sovereign capacity, has any direct interest; and, therefore, that it is not one of which the Supreme Court will take original jurisdiction as involving a controversy between a State and citizens of another State. On the contrary, it is respectfully urged that both the bill and the proof show that the State of Georgia, as such, has no such direct interest in the subject-matter as will give this Court jurisdiction.

Alleged Loss of Revenue.

The first insistence of the plaintiff is that property of its citizens, who reside within a designated part of its territory, is being injured. It is next alleged that be cause of such injury the plaintiff's income or revenue from taxation of such property is being lessened or diminished.

We again respectfully insist that while the taxing power is an inherent attribute of sovereignty, it is not a property-right. It in no way attaches itself to or becomes a part of any given property that may at any time happen to be within the jurisdiction of the State. More

properly speaking, it is simply a power inherent in sovereignty to require each citizen to contribute his proportionate share of money for public needs. It takes no heed of particular or special property, but levies against the citizen in proportion to the amount of property he may happen to have at the time fixed by law for assessment. The property upon which it is commonly said to be assessed may be sold, lost, or entirely destroyed. If injured or destroyed by the wrongful act of another, the State has no right of action against the wrong-doer, growing out of its sovereign power to tax. In such a case the injury to the owner is direct: that to the State, if any, remote, indirect, consequential. No case has been found where it has been held that the State has a right of action for injury to the property of its citizens on the ground that such injury secondarily results in loss of revenue to the State. If such a precedent should be established, then it would follow, of course, that the State would have a right of action in every case of injury to the property of any one or more citizens resulting in a decrease of the taxable value of such property.

Loss of Revenue in this Case Speculative.

Moreover, the alleged loss of revenue to the State of Georgia in this case is not only remote and indirect, but it is purely speculative. Indeed, there may be no loss at all. The individual owner, it may safely be assumed, will sue for and recover the full amount of the injury. These damages, whatever may be their amounts, are assessable for taxes in the hands of the property owner in the same way and to the same extent as the injured values for which they stand, or which they represent.

Hence, it will thus be seen that, although the taxable aggregate of land values in a given territory may be lessened, it does not necessarily follow that the State's income from taxes has also been diminished.

It may also be added that in this country no such paternal relation exists between the State and its citizens as that the property belonging to the latter also belongs to the State; and that injury to it also amounts to such direct injury to the State as gives it the right to maintain an action against the wrong-doer. If so, then in every case of injury, or threatened injury to property, tending to lessen its taxable value, the State would have the right to intervene, making the case of the citizen its case, redressing his wrong while redressing its own.

No Loss of Revenues in Fact.

In addition to the above, it is respectfully shown that the proof, instead of showing a loss of revenues to the State within the territory alleged to be injurd, shows a decided increase thereof—or, at least, of assessable values.

The counties in which the injury is alleged to have been done are Fannin, Gilmer, Murray, Towns and Union.

Following is a table showing

THE AGGREGATE VALUE OF ALL PROPERTY, BOTH REAL AND PERSONAL, RETURNED FOR TAXATION FOR THE YEARS 1890 TO 1905, INCLUSIVE, IN THE ABOVE-NAMED COUNTIES:

YEARS—	FANNIN.	GILMER.	MURRAY.	TOWNS.	UNION.	TOTAL FOR ALL COUNTIES.
1890	$ 610,105	$709,785	$1,306,658	$366,070	$616,680	$3,609,259
1891	643,674	787,135	1,289,733	383,103	620,693	3,724,338
1892	668,813	786,982	1,252,216	410,926	656,049	3,774,985
1893	634,116	729,330	1,165,920	386,725	656,999	3,576,090
1894	619,201	701,541	1,042,717	375,852	622,850	3,362,161
1895	629,431	663,782	996,811	354,271	582,739	3,227,034
1896	632,479	663,567	1,001,739	349,581	554,175	3,201,541
1897	658,175	653,250	993,577	360,474	528,737	3,194,213
1898	686,932	652,017	1,000,269	360,378	531,270	3,230,866
1899	719,170	688,345	1,043,332	349,718	528,857	3,329,422
1900	721,172	715,120	1,072,911	383,093	553,904	3,447,200
1901	643,674	787,135	1,289,733	383,103	620,693	3,724,388
1902	668,813	786,982	1,252,216	410,926	656,049	3,554,986
1903	935,795	769,366	1,100,924	376,180	576,845	3,759,110
1904	1,080,606	802,391	1,157,704	410,445	590,394	4,032,540
1905	1,019,709	827,500	1,265,111	418,851	640,845	4,172,016

See affidavit Chas. M. Seymour, Brief of Tenn. Copper Co. on Application for Restraining Order, page 54.

It is also shown by the affidavit of Mr. Seymour that Fannin county is the one adjacent to the works of the defendants, and the one in which it is alleged that most injury is being done. It is also shown in said affidavit, by tax tables therein set out, that in the districts of said county closest to defendants' works there has been an almost uniform increase of land values from the years 1895 to 1905. The districts referred to are Fair Play, Flint Hill, Hot House and Mobile. The increase of land values is shown by the following table:

	FAIR PLAY	FLINT HILL	HOT HOUSE	MOBILE
1895	$15,296	$17,221	$30,579	$20,688
1905	19,129	22,134	34,712	31,119

Affidavit of Chas. M. Seymour, same, p. 57.

It is also shown by the certified statement of Wm. A. Wright, Comptroller General of Georgia, which is made exhibit C to the affidavit of Mr. Seymour, that the taxable values of lands in Fannin county, which is the nearest county in Georgia to the defendants' works, increased from a total of $368,257 in 1890 to a total of $602,114 in 1905. During the same period it is shown that the increase of the taxable value of personalty in said county was from $247,848 to $417,595. The increase of both real and personal assessment values for the same period was from $610,105 to $1,019,709.

Attention is also respectfully invited to the land assessments of the several militia districts of Fannin county as certified to by the county ordinary. Almost without exception, they show a steady increase from 1895 to 1905.

Affidavit Chas. M. Seymour, same, pp. 63-69.

It may, indeed, be argued that, but for the alleged injury, the State's revenues would have been even greater than those resulting from the increased assessments

above shown. It is respectfully submitted, however, that there is no proof that would warrant such an inference, and mere speculation will not be indulged.

Alleged Injury to Public Roads.

While it is apparent from the averments in the bill that the alleged injury to public roads must, in the very nature of things, be almost wholly intangible, it is respectfully insisted that there is no proof whatever to sustain the charge. On the contrary, what proof there is shows that no such injury has resulted.

It is also respectfully urged that the demurrer to the bill on this point was well-grounded. It appears that the roads in question are not public highways, laid out and maintained by the State, but are local roads laid out and kept up by the people of the counties or districts through which they run. In other words, that they are not laid out and maintained by the State at large, but they are purely local in their character, the people of each county or civil district laying out and keeping up such highways as may suit their local convenience, the work, as shown by the laws of Georgia, being done chiefly by labor assessments.

No Injury to Public Roads.

Let the relation of the State to these local county and district roads be as it may, the proof unquestionably shows that there is not the slightest injury to them from the causes mentioned in the bill. The allegation of injury presents a theory rather than a condition, and is manifestly made for jurisdictional purposes only.

In the first place, it is to be noted that there has been no such widespread injury to vegetation from the fumes as would warrant the theory of injury to public roads therefrom. Without proof, it would instantly occur to anyone that the destruction of vegetation must be vast,

indeed, to materially affect the rainfall of any community.

As a matter of fact, it is shown, first, that prior to the suspension of mining and smelting operations at Ducktown in 1879, the original forests had been cut away from ten to fifteen miles around the mines and used as cord-wood and in making charcoal for use in mining and smelting operations; that during the period of suspension from 1879 to 1891 a young or second-growth of timber sprang up, which, after the resumption of operations in 1891, was also cut away and used in roasting operations.

It is further shown that the greater part of the apparent destruction of vegetation, and the apparent barrenness of the region around the mines, is due, not to the effect of the sulphur fumes, but to the wholesale cutting away of the timber for use in roasting and smelting operations.

Instead, however, of all vegetation being killed, even in the territory where the timber has been cut, it is shown that the wild or native grasses grow far more luxuriantly than before the timber was cut away. In fact, some of the witnesses state that they have never seen a more luxuriant growth of grasses anywhere east of the Mississippi than that around Ducktown where the timber has been cut. The facts disclosed by the proof show that there is, perhaps, now as much, if not more, vegetation, humus, etc., calculated to hold the water supply, than there was when the region was covered by young-growth timber; and, therefore, that there is really no basis for the theory that the rainfall runs off more rapidly than is normal, thereby causing freshets and overflows in the streams and injuring the public roads.

Affidavit of W. H. Freeland, Exhibit B to Answer of D. S. C. & I. Co., to Rule to Show Cause, p. 17.

Affidavit of J. M. Center, Ex. C, same, p. 29.
Affidavit of M. T. Fouts, Ex. F, same, p. 37.
Affidavit of B. P. Rollins, Ex. G, same, p. 43.
Affidavit of G. C. Parks, Ex. H, same, p. 48.

Moreover, it is clearly deducible from the proof that the cutting off of the timber, or, for that matter—the entire killing of it—over the comparatively small area in question, would not appreciably affect the rainfall—no more so than would result from the clearing of a like area for cultivation or a like area of prairie land, especially when it is covered by wild grasses. Vastly more territory is cleared of timber in any thickly settled agricultural region than here. And, as shown by the proof, in this district, where the timber has been cut away, native grasses grow in profusion, except immediately around the works. Under these conditions it is a far-fetched theory that the cutting away of the timber over such comparatively small area could appreciably affect the rainfall, and thereby indirectly result in injury to public roads.

Counsel for the defendant has failed to find where the plaintiff has made any effort to prove injury to public roads. On the other hand, it is shown affirmatively by public road commissioners and others, living in that part of Georgia contiguous to the mines, that the public roads have not, in any manner, been injured or interfered with by the defendants' operations.

Aff. W. H. McCay, Road Com., Flint Hill Dist., Fannin county, Brief Tenn. Cop. Co., on Plaintiff's Ap. for Rest. Order, p. 97. 29

Aff. J. J. Wehunt, Road Com. Mobile Dist., Fannin county, same, p. 98. 30

Aff. J. H. Pratt, same, p. 100. 31

Affidavit M. J. Webb, same, p. ~~108~~. 32

Aff. T. J. McKinney, same, pp. 111-112. 42

Affs. J. E. Lindsay, and 114 other citizens of Fannin county, same, pp. 114-117.

Affs. D. M. Williams and 17 other citizens of Gilmer county, same, pp. 118-119.

Affs. John Blarey and 11 other citizens of Towns county, same, pp. 120-121.

Affs. Chas. W. Griffiths and 46 other citizens of Union county, same, pp. 121-123.

Affs. J. W. Sperill and 23 other citizens of Murray county, same, pp. 123-124.

No Injury to Health.

While the bill charges that the health of citizens living in the designated counties has been and will still further be seriously injured and impaired as the result of the fumes, it is respectfully insisted that, even if this were true, it would give the State no right to intervene and maintain this suit in their behalf. At best, this could be done only where the general public health is being threatened or impaired by contagious disease, likely to spread over the State.

But the charge of injury to health really cuts no figure in this case. A diligent search of the plaintiff's proof fails to disclose where it is seriously insisted upon. Like the charge of loss of revenue, and that of injury to public roads, it might be important as a jurisdictional fact, if true, but the proof, as on the other points, fails to establish it.

In a few of the plaintiff's formal affidavits it is stated that the "haze" or "vapor" complained of "is perceptible to the eye and has a deleterious effect upon them." It is charged in the bill (par. 5), that said fumes render the atmosphere "dense, dark, impure, unwholesome and unpleasant." Again (par. 14), that they shut out the "pure air and sunlight." A large number of the plaintiff's witnesses state that they have often observed these fumes

"when the wind was from the defendants' mines" and that they are "dense in character."

It is a well-known scientific fact, however, that sulphurous acid gas, or sulphur dioxide, which, as plaintiff's complaint shows, is the only hurtful constituent of the fumes, is a colorless, *invisible* gas. The only visible component of the smoke is such as comes from the coal and coke used in smelting, and this is no darker or denser than that coming from any like plant using such fuel. Therefore, the charge that said fumes are thick, dark and dense, and that they shut out the pure air and sunlight, is purely a fiction of the imagination, and is no truer than is the case with any like plant using bituminous coal as a fuel.

The silence of the plaintiff's proof upon the charge of injury to health warrants the fair inference that it cannot be sustained. It is abundantly negatived, however, by many witnesses, both lay and professional, whose observation and experience entitle them to speak conclusively about the matter. Some of them worked for years around the now obsolete roast-piles, where the fumes were thickest and strongest. They suffered no ill-effects. On the contrary, it is shown that some, who were suffering from morbid conditions of the air-passages, were positively benefitted. Even without proof, it would be a matter of surprise to the average mind that ten or twelve thousand people would live and work year in and year out where these fumes are strongest, if it be true that they are harmful to health, or even as disagreeable as they are represented to be. The Ducktown mines have been worked off and on for over fifty years, and not until the plaintiff so charged had it ever been dreamed that the sulphur fumes, under the conditions existing at Ducktown, are hurtful to health.

Aff. W. H. Freeland, Ex. B, Ans. D. S. C. & I. Co. to Rule to Show Cause, p. 25.

Aff. J. M. Center, Ex. C, same, p. 30.

These facts are also shown by the affidavits of the following physicians:

B. M. Doyle, M. D., Ph. D.; A. W. Lewis, M. D.; E. M. Akins, M. D.; J. B. Bearden, M. D.; J. J. Barnes, M. D.; W. V. Garrett, M. D.; L. E. Kimsey, M. D.; R. L. Hyder, M. D. See Brief of Tenn. Copper Co. on Application of Plaintiff for Restraining Order, p. 71.

Affidavit H. A. Rogers, M. D., same, p. 72.

Affidavit J. M. Daves, M. D., same, p. 76.

Second. We think it plain from the allegations in the bill, as well as from the proof, that there has not been, and will not be, any such direct or substantial injury to the State of Georgia, in its corporate or sovereign capacity, as entitles it to maintain this suit in this Court. On the other hand, it is clearly shown that the alleged injury, if any, has been to the property of a few citizens, who live within a designated, but small integral portion of its territory. It is further manifest, not only from the bill, but from the proof, that the jurisdictional facts upon which it is attempted to ground the action, are far-fetched: in other words, that there has been no direct injury to the State itself; that this is not really a controversy arising directly between the State and the defendants, but is one between a few citizens of the plaintiff State and the defendants, in which the State has no direct, but, at most, only a remote, indirect, or contingent interest.

In fact, it appears that the only averments in the bill, upon which jurisdiction in this Court could possibly be grounded, to-wit: injury to the public roads and streams, to the public revenues, and to the health of citizens living in the counties named—have been practically abandoned in the proof. This is equivalent to a concession that they cannot be sustained, and that this suit was

brought, not because of any direct or substantial injury to the State itself, but for and in behalf of a number of its citizens, who claim to have been injured.

We think it clear, both in principle and upon authority, that a State cannot maintain a suit of this kind upon the ground of such remote, indirect, or contingent interest. *Pennsylvania vs. Wheeler Bridge Co.,* 13 *Howard,* 557.

Nor can a State, even with their consent, make the case of any part of its people its case. Nor can a suit of this kind be maintained, unless it be shown that the State in its sovereign or corporate capacity, or the people of the State at large, are being injured. If the injury be only to people residing in a designated, integral part of the State's territory, the State cannot maintain a suit therefor. If so, then it could sue for injury to a less number—even to one.

Louisiana vs. Texas, 176 *U. S.,* 22.

This view is taken in Story's Const., Vol. 2, sec. 1638, where it is stated:

> "8. To controversies between a State and citizens of another State; because, in case a State (that is, all the citizens of it) has demands against some of the citizens of another State, it is better that she should prosecute these demands in a national court than in a court of the State to which those citizens belong."

That the entire citizenship of the State at large, must be directly interested or affected is further shown in the case of *Missouri vs. Illinois,* 108 *U. S., p.* 208, in which this Court said:

> "The health and comfort of the large communities inhabiting that part of the State situated along the Mississippi river are not alone concerned, but contagious and typhoidal diseases introduced in the river communities may spread themselves throughout the territory of the State."

That case, however, was in some respects different from the one at bar.

There the injury was being done, or was about to be done, by a state, against which the people of Missouri had no adequate remedy, except by suit in this Court.

Here it is alleged that the injury is being done by private concern, against whom the citizens of Georgia have full and complete remedy, both at law and in equity, and both in the State and in the Federal Courts.

There the injury complained of affected, or was likely to affect, the people of the whole State through the medium of highly communicable disease.

Here, at most, only the property of a few citizens is being injured. The alleged injury to health is radically different from that in the Missouri case, not being through the medium of a communicable disease, and therefore impossible that it should affect the whole State.

The case of *Colorado vs. Kansas*, 185 *U. S.*, 125, is distinguishable upon substantially the same grounds. Its object was to enjoin the diversion of the waters of a stream in which the people of the plaintiff State had a direct interest. Again, it was not for mere injury to the stream, but for its practical destruction. Moreover, the people of Kansas, as a whole, had equal right with the people of Colorado to the use of the stream in its natural flowage, and they could not equitably be deprived thereof in order to confer it in its entirety upon the people of Colorado, who had no higher or better title than their own.

The controlling principle in the above-cited cases, so far as the question of jurisdiction is concerned, is that all the people of the plaintiff states were affected, and had a direct, tangible interest in the subject-matter of the suits. No such state of facts is shown in the case at bar. Only a few people of the State of Georgia, living in a designated portion of its territory, claim injury. The

great body of the people of the State have no interest in the subject-matter of the suit, unless it be an indirect, remote, or contingent interest. And it is respectfully urged that such interest is not sufficient to ground jurisdiction in this Court in a suit brought by the State.

It seems plain that before a state can maintain a suit of this kind the State, as such—not a few of its citizens —must be directly interested; that if the State can sue for injury to the property of a few of its citizens, it must follow that it could sue for injury to the property of even one. It seems manifest that the constitutional provision relating to controversies between a State and a citizen or citizens of another State was never intended to be applied to any case where the real complainant is not the State itself, but only a few of its citizens.

Demurrer Should be Sustained.

For the foregoing reasons, and especially in view of the failure of the plaintiff to sustain by proof the only jurisdictional facts upon which the bill could possibly be maintained, it is respectfully urged that the demurrer should be sustained and the bill dismissed.

BRIEF AND ARGUMENT UPON THE MERITS.

History of Mining Operations at Ducktown and a Description of the District.

In presenting the case upon its merits it may not be amiss to give a description of the district and a brief history of the mining operations at Ducktown.

Copper was discovered at Ducktown in 1849. The region was then a wilderness, inhabited by few white men, and the means of communication with the outside world was by mountain trails. Nearly all the land that had been entered by settlers and others, had been paid for at the rate of one cent per acre, although the district

had been opened for settlement by the removal of the Indians for over a period of ten years.

The district is in the heart of the Southern Appalachian chain of mountains at an average elevation of 1800 feet above the sea-level. Locally, it is known as the "Great Copper Basin," being surrounded on all sides by towering mountains, some of which reach an elevation of 4,300 feet above tide-water. This basin is itself cut up and bisected by high hills and ridges that might not improperly be classed as mountains themselves. There is no level land at all, except narrow strips bordering the mountain streams.

For the first few years after the discovery of copper, operations were confined to the mining of the oxide ores, which lay between the "gossan," or iron-ore outcrop, and the undecomposed yellow-sulphuret ores beneath. For a time these oxides were mined and shipped to Swansea, Wales, for treatment. At the end of 1853, or the beginning of 1854, however, furnaces were erected at Ducktown, by means of which the ores were reduced to a fifty per cent. regulus, or matte, and in this shape the product was carried to market.

At this time the Ducktown copper mines were the only mines in America, outside of the Lake Superior mines, that were producing any considerable quantity of copper. For this reason they attracted widespread attention and extensive operations were carried on.

As stated, from the time of their discovery the principal operations were directed to the mining of the rich oxides. About the time of the breaking out of the Civil War these ores had been practically exhausted. Experiments were made under the management of Captain J. E. Raht, looking to the utilization of the large and practically inexhaustible supply of the low-grade yellow-sulphurets. During the war the reserves of high grade ores, coupled with those of the lower grades, supplied the

armies of the Confederacy with a considerable portion of their *material* of war.

After the war, and after the complete exhaustion of the high-grade oxide ores, an effort was made to continue operations by working the low-grade sulphide ores. A number of causes contributed to its failure. The chief one was that under prior operations the timber used for fuel had been cut off for a distance of from ten to fifteen miles from the mines, and there being no railway connection at that time, the price of fuel made smelting operations impossible. In 1879 the company's affairs were wound up by a receivership in the Chancery Court.

The following extracts from a contribution by Mr. Carl Henrich, set out in the Transactions American Institute of Mining Engineers, Vol. 25, 1895, page 173, gives a clear idea of matters relating to the Ducktown district:

> "The country around Ducktown being densely wooded, and the soil very light and of the poorest kind, the mountainous parts of Polk county, especially, were settled at first very slowly and sparsely. * * * * * * It was in the year 1849 or 1850 that copper ores were first discovered in the Ducktown district. Chalcopyrite, impregnated in the quartz out-croppings of the Hiwassee ore-body (see map, Fig. 2) in the bottom of a small creek southeast of Ducktown, misled the original discoverer to believe that he had found a gold mine. The sinking of a shallow shaft on these croppings in 1850 led to the discovery of a rich zone of partly oxidized and concentrated copper ores—locally named "black copper" —which afterwards made Ducktown famous for its enormous deposits of rich copper ores. Notwithstanding the intense mining excitement at that time, as the result of the California gold fever, the sparsely settled state of this district, together with its inaccessibility, delayed for more

than a year the spread of the fame of the Ducktown copper region. * * * *

"But already in 1860, at the beginning of the War of the Rebellion, the production of the rich black copper ores had fallen off considerably. Experiments were in progress, under the energetic and competent management of Capt. J. E. Raht, to utilize the inexhaustible supply of low-grade sulphuret ores—the so-called 'yellow' ores of the district—in the production of copper. * * * *

"During the war, however, the Ducktown copper production was a valuable and necessary industry to the Southern States; the copper produced by these mines was sorely needed for the manufacture of cartridges and other war material; and the mines, therefore, were not allowed to remain idle. At the close of the war most of the black copper ore deposits had become exhausted, and the sulphuret ores, of which an inexhaustible supply seemed in sight, proved too low in copper to pay for extraction. * * * * The fuel used at that time was wood for roasting, and charcoal for smelting. * * * The dense forest originally covering the whole region had disappeared completely for miles around Ducktown, and the wood for the charcoal manufacture had to be brought from a distance of 10 to 20 miles. All supplies for the mines and works had to be hauled by teams, forty miles from Cleveland, Tenn., the nearest railroad point on the East Tennessee, Virginia and Georgia Railroad. Under these adverse circumstances, Capt. J. E. Raht managed to keep the mines going. But the company dispensed with his services, and instituted a monster lawsuit against the former manager, out of which Capt. Raht came with a complete vindication of his character and management. * * * * * * *

"After this came a period of complete inactivity in mining, followed by starvation of the people remaining in the neighborhood, and emigration

of the large majority of a once large and thrifty population. Where in 1860 *and* 1870 *probably four or five thousand people had found ample employment, in the years* 1887 *and* 1888 *probably less than five hundred tried very hard to eke out a scanty subsistence, hoping for better times from a revival of the once flourishing copper mines.*[1]

The revival of the mining industry of Ducktown came through the building of the Marietta and North Georgia Railroad, connecting the city of Knoxville, Tenn., with the town of Marietta, Ga., which is only twenty miles north of Atlanta. This railroad gave the Ducktown mines easy access to the coal-fields of Tennessee and Kentucky. Instead of charcoal at 10 cents a bushel (20 pounds), coke of a quality equal to Connelsville could be laid down at Ducktown at a little above $3.00 per ton. * * * * *

"Many metallurgists and mining engineers of good repute had visited and investigated the Ducktown ore deposits during the decade of their idleness. All of these investigators had found the ore too poor to pay if worked *for the copper alone; and as a sulphur ore the pyrrhotite of Ducktown was justly condemned by these experts.*[2] The fate of the district looked dark indeed. * * * * *

"In 1889 an English company, the Ducktown Sulphur, Copper & Iron Company, bought the interests of the Union Consolidated Company, or of its successors. They commenced operations in 1890 and spent considerable money in experimenting with combined roasting, leaching, and smelting processes, intending, as reported, to save everything contained in the ores—sulphur, iron and copper. A Mr. Gelstharp conducted these operations for about a year; but the processes were evidently not adapted to the ores." * * * * *

1 Italics ours.

2 Arthur Wendt, op. cit., says: "All these (Ducktown) mines, if worked for copper only, have ceased to be valuable, and are not likely in the future to again become profitable as a source of copper *alone.* (Wendt's *"Pyrites Deposits of the Alleghanies."*

E. D. Peters, Jr., had condemned the Ducktown mines as unprofitable copper-mines, because of too low percentage of copper, *and of no value as sulphur-ore, because the mineral was pyrrhotite.*

Character of Region and Soil.

The proof shows that the copper-mining district is located not only in a mountainous region, but that the soil is rocky, thin and of the poorest character.

It is shown that prior to the discovery of copper the district, because of its naturally sterile character, was but sparsely settled. Even during the period of suspension of mining operations, from about 1879 to 1891, when resort to farming became a necessity to those who remained in the district, there were but few—possibly five or six—so-called farms in the entire region that would produce enough to carry their owners from one season to another.

It is also shown that while, during the period of active operations prior to 1879, there was a population of at least 5,000 in the district, there were only 202 people in Ducktown in 1890, as shown by the Federal census of that year. When the shut-down came many of these people were compelled to leave on foot with their families. Of those who remained, hoping for a resumption of operations, many were compelled annually to seek employment elsewhere to earn a little ready money to pay their taxes and to meet other small necessities.

Aff. G. G. Hyatt, Brief Tenn. Cop. Co. on Application of plaintiff for Restraining Order, pp. 135-143.

Aff. Capt. C. L. Hensley, same, p. 133.

Aff. B. P. Rollins, Ex. G, Ans. D. S. C. & I. Co. to Rule to Show Cause, p. 42.

Aff. M. T. Fouts, Ex. F., same, p. 36.

Aff. G. C. Parks, Ex. H., same , p. 47.

Timber Interests of the Region.

The orginal forests of this region were such as usually grow in a thin, rocky, sterile, mountain soil. It has been shown that prior to 1879 practically all the timber

for a distance of ten to fifteen miles around the mines was cut off for use in roasting and smelting operations. During the period of suspension of mining operations from 1879 to 1891 a young, or second growth, sprang up, which, prior to the abandonment of open-heap roasting, in 1902, was also entirely cut away for use as cordwood in roasting the copper ores. This young growth was small and scrubby, as might have been expected from the nature of the soil.

From the standpoint of lumbering the timber never amounted to much. The fact that it was almost altogether used for fuel in smelting operations shows where its chief value lay.

The fact that all the timber has been cut from such a large area gives the region a somewhat barren appearance, which is calculated to mislead those who are not familiar with it and cause them to think that it is due to the destruction of timber by the fumes. Some of the plaintiff's witnesses, from a cursory inspection of the region, appear to have reached this conclusion. Yet the fact that the entire region, except near the works, is covered with a rank growth of wild or native grasses shows the conclusion to be wrong. It is shown that where the timber was left it was green and uninjured.

It is shown by the affidavit of G. G. Hyatt, (Brief of Tenn. Cop. Co., on App. for Restraining Order, p. 141), that the defendants own 20,000, acres or about thirty-one square miles of land in the district, and that the greater part of the injury is confined to this area.

Dr. G. A. Schenck, professional forester in charge of the Biltmore preserves, in a report of an examination of the forests nearest the Ducktown mines, says:

> "All over the Appalachian region there has been witnessed of late years a mortality of trees exceeding by far that natural rate of death which occurs under primeval conditions. It is obvious that sensitive species, like chestnut amongst the

hard-woods and like white pine amongst the soft-woods, have shown a particularly striking mortality. . . . . .

"In the Ducktown region the increased mortality of the timber is frequently attributed solely to the action of sulphur fumes on the forest vegetation. Whilst a poisoning influence of sulphur fumes on vegetable life takes place without doubt in the immediate proximity of any smelting-works, a damaging effect of sulphur fumes could be detected on the properties investigated only in rare instances. In a large majority of cases the deterioration of the timber lands is due to carelessness on the side of the owners in treating their timber; to the axe and to the saw; to gradual dessication of the soil; to forest pasture; to forest fires; to insects; and to pathological diseases.

"In certain cases severe storms have played havoc with the timber in the more recent past, prostrating, notably, the flat-rooted species of the forest (hemlock and white pine). . . . . .

"The timber in the region under observation, in primeval times, must have been of a very poor description, perhaps of the poorest description found anywhere in the Appalachian region. Hardwood timber of any value to the lumberman is found, and can have existed only in the cool, deep pockets or small coves formed by the creeks tributary to the Ocoee and Hiwassee rivers. Amongst the soft woods white pine, invariably of the inferior quality, occurs on the northern slopes and along the valleys of the creeks, whilst yellow pine prevails in knotty short-boled specimens on the ridges and on the upper slopes."

Methods of Treating Copper Ores.

The proof shows that from the time copper-smelting first began at Ducktown in the fifties, up to 1902, no way or method had ever been found whereby these ores could be successfully treated other than by what is known as the open-heap method of roasting. The ores carry

approximately 25 per cent. of sulphur, and up to 1902, it had been found impossible to smelt them in the furnaces without first expelling the greater part of the sulphur by this preliminary roasting. If the roasted ores carried above a certain percentage of sulphur, it prevented the proper separation of the molten copper from the slags in the furnaces, and also resulted in the chilling of the furnaces and their consequent stoppage.

The ores being monosulphides, or pyrrhotite, instead of bisulphides, or pyrite, it was also found impossible to roast them in stalls, kilns, shelf-burners, or in any other way than in open piles in the open air, whereby all the fumes arising from the roasting were necessarily thrown off into the surrounding atmosphere. While bisulphide ores, as a rule, may be easily roasted in stalls or kilns used burning such ores in the manufacture of sulphuric acid, it has always been found impossible to successfully roast the monosulphides in that way. They burn imperfectly, chill and frequently "scar," or "sow," rendering it impossible thereafter to smelt them in the furnaces, as will be hereinafter shown.

In open-heap roasting, hearths or level places were made on the ground, each being about thirty by fifty feet. On this was placed a layer of cord-wood about eighteen inches deep. On top of the wood was placed a pile of broken ore of about two hundred tons. The wood was then fired, which, in turn, set fire to the sulphur in the ore. The roasting was a slow process, three or four months being required to finish each pile. After cooling, the ore was drawn, taken to the furnaces and smelted.

Aff. W. H. Freeland, Ex. B., Ans. of D. S. C. & I. Co. to Rule to Show Couse, p. 18.

Experiments Made by the D. S. C. & I. Co., Ltd.

While up to the time the defendant Ducktown Sulphur, Copper & Iron Company, Limited, came into the field in

1891, the open-heap method was the only one that had ever proved successful in the treatment of these ores, this company desired, if possible, to utilize the sulphur and iron contents of the ores as by-products. There was every financial inducement to prompt this course. Hundreds of dollars worth of sulphur and iron had been wasted daily under the open-heap process. If these could be saved, they would make profitable what might otherwise prove to be an unprofitable business. Accordingly, it spent considerable time and large amounts of money in trying every process known to metallurgy, and many experimental ones, in the endeavor to find some way to utilize the iron and sulphur, but to no avail.

Dr. Pierre de P. Ricketts, one of the leading experts of the world in the treatment of copper ores, and who during several years past held the chair of Analytical Chemistry and Assaying in the School of Mines, Columbia College, testifies:

> "That he has been familiar with the Ducktown copper mines and their ores for many years, reaching as far back as 1867 in the time of the old Union Consolidated Mining Company, and that for the past ten or twelve years he has been personally familiar with them by reason of having often visited them in a professional capacity. That the ores remaining there are large in quantity, but of extremely low grade—so much so as to make it commercially impracticable to ship them any considerable distance to another district for treatment.
>
> "Affiant further states that when the Ducktown Sulphur, Copper & Iron Company, Limited, went into that district about 1891, he acted as its consulting engineer and metallurgist, and that under his advice and direction the better part of two years and something like two hundred thousand dollars were expended in various tests and experiments to find some way of utilizing the iron and sulphur contents of the ores; that stall-roast-

ing, kiln-roasting, roasting in revolving cylinders, and various other methods were tried. Special kilns of extensive character were built. None of them were successful, and it was upon affiant's advice that the company finally fell back upon the only method theretofore used, to-wit: preliminary open-heap roasting before smelting."

Aff. Dr. Ricketts, Ex. A., Ans. D. S. C. & I. Co. to Rule to Show Cause, p. 12.

Aff. W. H. Freeland, Ex. B, same, p. 18.

Pyritic, or "Green Ore" Smelting.

While the company was thus forced either to resort to open-heap roasting or quit the field, it did not cease its efforts to find some way of saving the waste products. From 1893 to 1902, however, the open-heap method was in continuous use. For some time prior to the latter date the company's general manager had been making experiments which finally resulted in the perfecting of a method by which the ores are smelted without previous roasting. The chief advantage of this over the old process lies in the fact that such fumes as come from smelting the ores in the furnaces are carried by the stacks into the higher strata of the atmosphere where they become diluted, disseminated and scattered, instead of being blown along in full strength near the surface of the ground, as were those that came from the roast-pile.

While it was manifestly impossible to collect and condense the fumes coming from heaps covering several acres, it was hoped that some way could be found to precipitate those coming from the comparatively small compass of furnace stacks. Pyritic smelting was experimentally tried when the company first came into the field, and in connection with it a tall tower was constructed and filled with coke and an attempt made to wash down with water-spray the sulphur gases, thus making a weak sulphurious acid; but both the pyritic

smelting, and the attempt to utilize the gases, proved failures. Since the successful inauguration of pyritic smelting other experiments with the gases have been in progress, but thus far without practical result.

A high blast-pressure is required in pyritic smelting, and this so dilutes the comparatively small percentage of sulphur dioxide yielded by mono-sulphide ores as to render sulphuric acid-making impracticable in connection with smelting operations. In fact, there is no instance known where the manufacture of sulphuric acid has proved practicable from gases arising from smelting operations. (See first question and answer, page 38, herein.) As already stated, mono-sulphide ores of the Ducktown variety have not only been found unavailable in the manufacture of acid, but in the case of bisulphide ores that are adapted to acid-making, and carrying copper also, the process is to burn the ores in stalls and kilns especially adapted to acid-making, and then afterwards treat the resulting cinder for the copper it contains. The manufacture of acid has hitherto been found possible only with ores that are not only richer in sulphur, but which will also readily yield it, instead of being refractory in this respect, as are the Ducktown ores.

Aff. W. H. Freeland, Ex.. B., Ans. to Rule to Show Cause, p. 19.
Aff. Dr. Ricketts, *supra*.

Ducktown Ores Not Suited to Acid Making.

The plaintiff, in its proof and in its argument, devotes considerable space to the proposition that the proper solution of the question involved in this case lies in the conversion of the sulphur fumes into sulphuric acid. In its supplemental evidence many pages are given to statistics relating to fertilizers and to the quantity of sulphuric acid used in their manufacture. The affidavits of several manufacturers of fertilizers are also set out; but

no proof is offered to show that the Ducktown ores are adapted to acid-making.

> See affidavits of R. F. Sims, D. B. Osborne, H. A. Rogers, pp. 49-55, Plaintiff's Supplemental Evidence.

In the first place, it would strike one not familiar with the subject as being odd, if it were possible to make acid from pyrrhotite ores that the large deposits at Ducktown should have remained untouched for this purpose for over fifty years. It would seem still stranger when seen from the testimony of the plaintiff's above-named witnesses that they import, all the way from Spain, at heavy expense, the greater part of the pyrites used by them in acid-making. Moreover, there are other much larger deposits of pyrrhotite ores in other parts of the United States, which are being worked for copper, but which are unavailable for acid-making. The reason why they are not thus available is due not only to the fact that monosulphides carry less sulphur than the bisulphides, but still more to the fact that the chemical union of the constituent elements of the ores is different, the monosulphides, or pyrrhotite ores being so refractory that hitherto they have balked all efforts directed towards the utilization of their sulphur contents.

Lunge, in his work on Sulphuric Acid and Alkili, 3d edition, page 58, in giving the location of the various pyrites deposits of the world that are suitable for acid-making, mentions the Tallapoosa, Dallas and Rogers mines in Georgia, but says nothing about the very much larger Ducktown deposits. The Georgia deposits mentioned are small, but their ores are chiefly bisulphides and, therefore, adapted to acid-making.

Mr. Carl Henrich, in his paper, "The Ducktown Ore Deposits," Transactions of the American Institute of Mining Engineers, Florida Meeting, 1895, *supra*, says:

"The Ducktown deposits are, as to their main metallic contents, bodies of pyrrhotite, with subordinate marcasite, pyrite, chalcopyrite, zinc-blende and galena." (p. 34.)

Again, p. 40, he says:

"The sulphuret ores of other ore-bodies, as, for instance, the Mary Mine, consist mainly of pyrrhotite with impregnations or enclosures of chalcopyrite."

Again, p. 57, he says:

"It is painful to contemplate the waste of about 20 per cent. of sulphur (i. e., of 40 tons of sulphur per day) from each 200 tons of ore roasted. If the sulphur were only present in more concentrated form and capable of economical utilization, its value would greatly exceed that of the copper in the ore; but no practicable method of saving it is now available."

Lunge, in his work above cited, page 76, in telling how to determine whether a given kind of pyrites is suitable for acid-making or not, and what to avoid, says:

"*Magnetic pyrites* (*pyrrhotite*), is sometimes present, especially in some kinds of American pyrites. As that ore yields its sulphur very imperfectly in ordinary pyrites-kilns, its estimation may become important."

Peters, one of the foremost authorities in the world, in his work, "Modern American Copper Smelting," 2d Ed., page 120, (8th Ed., p. 168) says:

"One of the most serious errors ever perpetrated in the manufacture of acid from pyrites is the attempted employment of pyrrhotite or monosulphide of iron for pyrite—bisulphide of iron. Aside from the greatly lessened proportion of sulphur, 36 as against 53 per cent., the monosulphide will not even yield freely what sulphur it contains, but crusts with oxide of iron, turns black, and is soon extinguished when treated in an ordinary pyrites kiln. It seems scarcely possible that extensive works for the manufacture of

sulphuric acid (and copper) should have been erected, their ore supply being entirely derived from a deposit of the valueless monosulphide; but such has been the case in more than one instance, and will continue to be so in enterprises conducted without the aid of skilled direction. One of the most striking instances of this kind is a now extinct Massachusetts company, which is said to have expended over $200,000.00 in this manner, all of which was a total loss, excepting the small amount realized from the sale of buildings and lands."

Again, Peters (2d Ed., p. 23) says:

"The noted Ore Knob mine in North Carolina has probably seen its best days, but vast quantities of low-grade ores are said to still exist in the Pyrrhotite mines of Ducktown, Tennessee." . . . . .

"In Georgia and Alabama there are considerable bodies of pyrites suitable for acid-making that will in time, no doubt, add their mite to the production of copper, but it is an unfortunate fact that there is as yet no sign in any part of our country of those immense cupriferous masses of iron bisulphide that have rendered the Iberian peninsula so famous." . . . . . .

Again, page 8, Peters says:

"When the accompanying mineral is bisulphide of iron and the locality is favorable, the pyrite may be utilized in the manufacture of sulphuric acid, the copper being extracted from the residue by well-known methods; but when the prevailing mineral is the *mono*sulphide—magnetic pyrites—there can be no question of profitable working, pyrrhotite being absolutely valueless since copperas has become a by-product of fence-wire making." . . . . . .

Plaintiff's counsel intimate in argument (Argument on Application for Leave to File, p. 8) that the defendants let their sulphur go to waste because it is more prof-

itable to do so than to save it. Yet, on the other hand, in the plaintiff's supplemental evidence statements are made and statistics given which are evidently intended to show that sulphuric acid can be made at Ducktown with profit. It is manifest, however, from the foregoing that in reaching their conclusion counsel have overlooked the fact that monosulphide ores have never been successfully used on a commercial scale in the manufacture of sulphuric acid. It seems too plain to need verification that if this were possible, these defendants would not permit the waste of hundreds of dollars worth of sulphur daily.

Sulphuric acid can be made on a commercial scale only by the burning of pyrites in stalls or kilns especially adapted to acid-making. No instance is on record where it has ever been made from the fumes coming from the smelting of ores in a blast furnace. As shown by Peters, Lunge and others, the monosulphides or pyrrhotite cannot be successfully burned or roasted in stalls or kilns. It crusts with iron oxide, "scars," "sows," turns black, and is soon extinguished. It neither roasts sufficiently to discharge what sulphur there is in it for acid-making, nor to enable the cinder to be afterwards smelted in the furnaces.

As already stated, the main reason why sulphuric acid cannot be made from fumes coming from blast-furnaces is that they are so diluted by the high-pressure blast as to render it impracticable. Lunge, in his work above-cited, page 370, says that if less than 4 per cent. of sulphur dioxide by volume is present, its "utilization by condensation or conversion into sulphuric acid is out of the question."

A statement is made by plaintiff's counsel (Supplemental Evidence, p. 34) that 6 per cent. is the strength of the gases generated by the Tennessee Copper Company, and a gratulatory newspaper statement, said to

have come from the president of that company, is cited as evidence. We do not construe the statement quite that way; but, however it may be, a thorough test of the gases coming from the furnaces of the Ducktown Sulphur, Copper & Iron Company, covering several weeks in last year, showed the strength by volume of the sulphur dioxide to be only 3.70 per cent.

Lunge says again (p. 373 of his work above-cited): "Where, however, there is less than 4 per cent. of sulphur dioxide in the gases, any utilization is out of the question." In the same connection he also shows that condensation of the fumes by water, and the production of liquid sulphurous acid, is possible only where the gases are sufficiently concentrated to convert them into sulphuric acid in lead chambers.

In burning pyrites in stalls or kilns for acid-making there is no forced draught or blast, and, consequently, very little dilution of the fumes by admixture of air or inert gases; but in pyritic or "green ore" smelting the required high-pressure blast greatly dilutes them and reduces the percentage of sulphur dioxide below that necessary for their successful conversion.

If it be urged that the process should be reversed—that the ores should first be incinerated, the gases collected and converted into acid, and then the resulting cinders be smelted for copper, the answer is as shown above by Henrich, Peters and others that ores of the Ducktown variety are not adapted to acid-making because their peculiar chemical make-up has thus far baffled all effort to successfully roast them in sulphuric acid stalls or kilns. And their "sowing" or "scarring" while roasting makes it impossible to properly smelt them afterward.

Manufacture of Sulphuric Acid at Ducktown Commercially Impracticable.

Even if these ores were adapted to the business, it will be seen from a brief study of the figures that the manu-

facture of sulphuric acid at Ducktown is practically impossible, even from a commercial standpoint. There must be a market for it.

John M. McCandless, State Chemist of Georgia, in his testimony, (page 60 of Plaintiff's Supplemental Evidence), says that, on the basis of its output of ore, the Tennessee Copper Company alone could produce annually 851,206 tons of 50 per cent. or chamber acid.

Counsel for the Plaintiff (Supplemental Evidence, p. 3) estimate the ore-tonnage of the Ducktown Sulphur, Copper & Iron Company to be about one-seventh that of the Tennessee Copper Company, and, therefore, that the two companies together could produce annually in the neighborhood of 1,000,000 tons of chamber acid.

The total consumption of sulphuric acid in the United States *for all purposes* in 1905, as shown by Bulletin No. 57, U. S. Census of Manufactures, was approximately as follows:

50 deg. Baume, (chamber acid)	1,000,000 tons
60 deg. Baume	50,000 tons
66 deg. Baume, (oil of vitriol)	600,000 tons
Miscellaneous strengths, stronger than the above	6,000 tons
Total	1,656,000 tons
All calculated to chamber-acid strength, approximately	2,000,000 tons

It will thus be seen that Ducktown alone, not to mention the large pyrrhotite deposits extending along the Appalachian chain from Alabama into Canada and the vast deposits in the western states, would make 50 per cent. of the whole quantity of sulphuric acid consumed in the United States.

Freight Rates on Sulphuric Acid.

It is well known that, except for comparatively short distances, freight rates on sulphuric acid are prohibitive. It is due to this fact that sulphuric acid producers usually find it cheaper to ship pyrites for the manufacture of the acid, even from such distant points as Spain, than to pay

freight on the acid made where the ore is mined. Moreover, the difference in the percentage of sulphur in the Rio Tinto, or Spanish ores, and the Ducktown ores would undoubtedly render the use of the latter impossible. It is shown by the affidavits of R. F. Sams and other fertilizer manufacturers, (pp. 49 *et seq.* of Plaintiff's Supplemental Evidence), that the Spanish ores used by them yield 50 per cent. of sulphur, while the Ducktown ores will not average above 25 per cent.

Plaintiff's counsel state (Plaintiff's Supplemental Evidence, pp. 3 and 4) that the five states of Georgia, North Carolina, South Carolina, Alabama and Florida used 2,047,950 tons of fertilizers in 1904, and that as 800 pounds of sulphuric acid to the ton are used in their manufacture, these States would consume the entire possible output of these defendants. The further statement is made that Georgia alone would consume about one-third of the gross possible product.

The output of the Tennessee Copper Company alone is figured by Mr. John M. McCandless, State Chemist of Georgia, in his affidavit (Plaintiff's Supplemental Evidence, p. 60) at 851,206 tons.

By reference to Plaintiff's Supplemental Evidence, pp. 37 and 38, it will be noted that the above figures given by counsel as to the tonnage of fertilizers used in the five States named were taken from the American Agriculturist, and that the tonnage for 1904 is given as 2,000,005, while that for 1905 is given as 2,047,950.

Below is a table furnished by the Acting Director of the Bureau of Census, Department of Commerce and Labor, showing the number of fertilizer factories in said states in 1904, and showing that the quantity of sulphuric acid used in all of them in the manufacture of fertilizers in that year amounted to only 369,873 tons, all of which, except 16,533 tons, was made by the plants consuming it. (See Exhibit A appended hereto.)

NUMBER OF FERTILIZER FACTORIES AND QUANTITY OF SULPHURIC ACID USED.

States.	Number of Factories.	Total Number of Tons Sulphuric Acid Used.	Tons of Sulphuric Acid Purchased.	Tons Sulphuric Acid Made and Consumed.
Alabama	19	46,296	11,375	34,921
Florida	8	7,300	100	7,200
Georgia	57	174,361	3,443	170,918
North Carolina	27	59,454	20	59,434
South Carolina	20	82,462	1,595	80,867
Total	131	369,873	16,533	353,340

It may be safely assumed that, with the addition of Tennessee, the above-named five states would furnish the field to which the defendants would, by reason of prohibitive freight rates, be compelled to look for a market. The figures furnished by the Census Bureau as to Tennessee are as follows: Number of factories, 10; total number of tons of acid used, 56,026; tons of acid purchased, 7,155; tons of acid made and consumed, 48,871.

From these figures it will be seen that the total quantity of sulphuric acid used in the manufacture of fertilizers in these six states was 425,899 tons. Of this quantity 402,211 tons were made by the plants where it was consumed, while only 23,688 tons were purchased elsewhere.

It will thus be seen that a portion of this 23,688 tons, or of some like insignificant quantity, would be the prospective market for the Ducktown plants, which, according to the plaintiff's own estimates, would be producing approximately 1,000,000 tons, or about one-half of the entire output of the United States. The consumption of sulphuric acid in these states for other purposes is comparatively insignificant. Plaintiff's counsel mention the manufacture of explosives as one in which sulphuric acid

is used, but reference to table 43, Bulletin 57, of the Census of Manufactures, shows that in the entire country in 1905 only 49,202 tons were thus used.

Other figures furnished by the Acting Director of Census, Bureau of Manufactures, show that in the ten states of Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee and Virginia there were in 1905 one hundred and ninety-one fertilizer factories, which used 535,231 tons of sulphuric acid. Of this amount 489,213 tons were made by the factories consuming it, while 46,018 tons were purchased elsewhere. (See Exhibit B appended hereto.)

It will thus be seen that if it were possible to ship the acid from Ducktown to the most distant points in these states, and if the defendants should have a complete monopoly of the trade, their output, according to the estimates made, would be nearly double the quantity required.

Nearly one-half of the sulphuric acid made in the United States in 1905 (889,769 tons) was used in the manufacture of fertilizers, and 692,904 tons of this was made by the plants consuming it. (Table 44, Bulletin 57.) The quantity produced, but not consumed, was 23,997 tons of 50 degree Baume and 337 tons of 66 Baume.

It will thus be seen that the Tennessee Copper Company, alone, according to the estimates made by Mr. John M. McCandless, State Chemist of Georgia, (Plaintiff's Sup. Ev., p. 60), would produce approximately an amount sufficient to meet the demands of the fertilizer interests of the entire country, while both companies would produce approximately one-half of the entire quantity used for all purposes in the United States.

To acquire any portion of the market the defendants would not only have to have an ore adapted to acid-making, but they would have to be able to make the acid

and sell it at the place of consumption at a lower figure than it costs the fertilizer manufacturers to make it. This is so, because the above statistics show that these manufacturers themselves make the greater part of the acid they use. Their plants are already engaged in the business, and before they could afford to buy elsewhere, the figures would have to be not only lower than it costs them to produce acid, but also sufficiently low to warrant them in abandoning their costly plants.

Plaintiff's counsel furnish affidavits showing that $10.40 per ton is the approximate market price in Atlanta of sulphuric acid in carload lots. It will be seen from the figures of production and consumption above given that only a comparatively small part of the acid made is sold. By far the greater part is consumed in the plants where it is made. They buy little in the open market. It is hardly necessary to say, therefore, that in the light of the possible production at Ducktown and the figures given above as to the amount consumed, the above-mentioned price could afford no rational basis from which to figure prices of the Ducktown product. Conditions would be revolutionized.

From the foregoing we respectfully submit that, even if the ores were adapted to acid-making, their utilization in that way would be commercially impracticable. In the case of Mountain Copper Co. vs. United States, 142 Fed. Rep., 625, the ores in question were adapted to acid-making, but the Court refused an injunction, saying:

> "That it is possible to convert the sulphur fumes into sulphuric acid is, of course, conceded; but that it is wholly impracticable to do so, by reason of the enormous quantity of such acid that would thus be produced, the enormous cost of such production, and the impossibility of disposing of such product, is clearly shown."

Effect of an Injunction.

Even if it were possible for the many large copper-smelting concerns in the United States using sulphide

ores to convert their fumes into acid, the almost certain effect of their being required to do so would be to drive the greater part of them out of business. There would not only be no market for the huge quantity made, but even if the companies could stand the financial loss of making it, and then wasting or storing it, the latter would be impracticable, not only on account of the nature of the stuff, but on account of its quantity also. If poured out, or stored in vats in the ground, it would percolate through the soil, poisoning the streams for hundreds of miles and creating an unendurable nuisance.

In the opinion of the United States Circuit Court of Appeals for the Ninth Circuit (California) in the case of the *Mountain Copper Co., Ltd., vs. The United States,* (142 Federal Reporter, 625), which was a case involving practically the same question as in the present one, except there the ores were adapted to acid-making, the following testimony, upon which the court largely based its opinion, is set out in full:

> Q. What have you to say regarding the charge in the bill in this action that you have negligently failed to condense the fumes from the smelter before turning them into the air?
>
> A. No smelter is able to condense these fumes. No smelter does it.
>
> Q. Is there any American copper smelter which pursues a course substantially different from yours in reducing its ores?
>
> A. We have never heard of it.
>
> Q. You would have known of them if there were such instances?
>
> A. We should have known them, and when we have heard of cases that purported to offer certain advantages, we have had these cases investigated.
>
> Q. There is no way of condensation known for handling ores of such a quality and character?
>
> A. No, sir; not any.
>
> Q. What would be the effect upon the industry

of copper-smelting in America if every smelter were compelled to condense its fumes?

A. The industry would die for some time. It would have to die until having been the largest producer of copper in the world it was forced to come again into supply by shortage of copper from other sources of supply which were not affected by such restrictions.

Q. In other words, if I understand you, copper could never be produced in America under those conditions until the entire supply of the world elsewhere had been exhausted, and it becomes a matter of no importance what price was charged for copper?

A. Yes; that is to say, until the supplies elsewhere in the world had been proved to be insufficient to meet the demand at the increasing price of copper.

. . . . . .

Q. How much sulphuric acid would be manufactured from the burning of 600 tons of your ore per diem?

A. Well, 700 tons per day; it would depend upon the strength of the acid, but let us say 700 tons per day of such strength as would be manufactured in such a system.

Q. Of commercial acid.

A. Of commercial acid.

Q. Suppose you had your plant there and manufactured your 700 tons a day of sulphuric acid —what disposition could you make of it?

A. We could make no disposition of it other than to carry it down to San Francisco by rail, put it in boats and dump it into the sea.

. . . . . .

Q. Could it be disposed of in any way at Keswick?

A. No, sir; it could not.

Q. Suppose you undertook to store it there, what would happen?

A. Either the storage would have to be enormous, or, if it were stored in ponds or reservoirs

made in the soil, the heavy rains in winter would wash it away into the drainage system of the country.

. . . . . .

Q. Is there any mode of combining this acid with any other substance so as to give a commercial return at Keswick?

A. No, sir.

Q. What is the total consumption of sulphuric acid in California?

A. Seventy to eighty tons per day.

Q. What would be the effect if you were required to turn your fumes into sulphuric acid at Keswick?

A. It would cause that business to suspend operations.

Q. You would have to shut your smelter down and close your mines?

A. We should have to shut our smelter down.

Q. You could not work your mine without your smelter?

A. We should not be able to work our mine, unless we could dispose of our ore profitably. That is doubtful.

Q. Your present industry as you are carrying it on would be destroyed?

A. It would be destroyed.

Q. And you would have to find a market for your ores in some more favored community?

A. Yes, sir.

Q. Would it be practicable to ship your ores any great distance?

A. No, sir.

Q. The values would not warrant any extended shipment?

A. No, sir.

Q. Any distant shipment?

A. No, sir; the values would not justify any long transport.

Q. Is this a unique condition of affairs at Keswick, or do your answers with regard to the difficulties and impossibilities of disposing of your fumes apply to smelters in general?

A. They apply to smelters in general, not only to copper smelters, but lead and zinc smelters.

Q. The attack, then, which the government makes on your industry, if it should be followed up by similar attacks upon others carrying on the same industry elsewhere, would, if I understand you, result in the destruction of the copper industry of America?

A. If it was successful—yes, sir.

Q. I am assuming it would be.

A. Yes, sir; it would affect six and one-half million tons of ore per annum.

Q. That is to say, it would destroy that amount of production?

A. Yes, sir; that is so.

Q. Something has been said about the sale of pyrites—that is to say, the sale of your sulphide ores from your mines. Is that possible in any large quantity?

A. No, sir.

Q. There is no market for them?

A. There is no market.

The above case is referred to by counsel for the plaintiff (Supplemental Evidence, p. 3) and the statement made that it had been judicially determined by the Court that it is possible to convert the fumes into acid. This is true, but it is because the ores in question in that case were bisulphides and, therefore, adapted to acid-making. This fact is not directly stated in the opinion, but it is indirectly shown when it is stated that the defendant in answering says, among other things, that its ores contain from 30 to 50 per cent. of sulphur. It is a well-known metallurgical fact that bisulphides carry from 35 to 50 per cent. of sulphur, while the monosulphides carry from only 15 to 30 per cent., depending upon the admixture gangue matter. And the above-cited case was decided favorably to the company, not because the ores were not suited for acid-making, but on the ground that it was commercially impracticable under the circum-

stances to convert the fumes and dispose of the product.

It further appears from reading the opinion and the evidence cited in it that what the Court meant when it said that it was conceded that it was possible to convert the fumes into acid was that this could be done, provided a regular sulphuric acid plant should be installed; that is, if the ores should first be burnt in acid-making stalls or kilns, the fumes collected and converted, and the cinders afterwards treated for copper; but the witness Wright shows that the cost of a plant of such magnitude as would be necessary to handle the amount of ore required to pay interest on the investment would be prohibitive, not to mention the want of a market for the acid. He further shows that it is impossible to convert the fumes coming from the smelters—that no smelting company has ever done that.

In this connection it may not be amiss to say that in the case of *Madison et al. vs. Tennessee Copper Company et al.*, 113 *Tenn.*, 338, it was judicially determined that at that time there was no method, other than by open-heap roasting, by which the Ducktown ores could be successfully treated, and that there was no known way of condensing the sulphur fumes arising from such roasting.

Great Copper Interests of the West.

As already shown, the Ducktown district alone, if the sulphur fumes arising from the operations there could be converted into sulphuric acid, would produce approximately one half the quantity consumed for all purposes in the United States; but this quantity would be small when compared with the production in other parts of the country, particularly in the West.

The Amalgamated Copper Company, with a capital of $155,000,000, owns a controlling interest in the Anaconda, Parrot Silver & Copper, Washoe Copper, Colo-

rado Copper & Smelting and many other companies. Its interests are chiefly at Butte, Montana, which district produces an average of 16,000 tons of ore daily, carrying an average of 14 per cent. of sulphur. This alone would produce 4,000,000 tons of chamber acid per annum.

The American Smelting & Refining Company, with a capital of $50,000,000, owns and controls twelve to fifteen different mines and plants, yielding and treating approximately 8,000 tons of ore daily, which carries from 15 to 20 per cent. of sulphur. This would produce annually about 2,500,000 tons of chamber acid.

The Arizona Copper Company and the Detroit Copper Company of Arizona could produce upwards of 200,000 tons yearly, and they are but a fraction of the mines in Arizona. To these would be added those of the California smelters, the immense plants in Utah, New Mexico, Nevada, Colorado, and Washington, not to mention others in the eastern part of the country. To even estimate the total quantity of acid that could be produced from the fumes of copper-smelting alone would be impossible, but 15,000,000 tons annually would undoubtedly be below the actual tonnage. And whatever may be the real figures, it is plain that the sulphuric acid proposition in connection with copper-smelting, even if it were feasible so far as the manufacture is concerned, is utterly impracticable when the vast quantity that would be produced, the cost of its production and the want of market for it are considered.

Other Schemes for Rendering Fumes Innocuous.

Perhaps no line of endeavor in the field of metallurgy has enlisted more attention than the finding of some way to condense, or render innocuous the fumes arising from copper-smelting. The great desideratum, of course, has been to find some way by which this can be done with profit, but experiments have by no means been limited to this object. Apparently, every conceivable plan has been

tried, but the one most successful has undoubtedly been to carry the fumes by means of chimneys or stacks into the higher strata of the atmosphere where they become so scattered and diluted as to do little or no damage. The affidavits of Robert R. Maffett, Superintendent of the Orford Copper Company; Otto R. Jaecker, designer and builder of stacks for industrial, chemical and smelting works; W. R. Rust, General Manager of the Tacoma Smelting Company, and George R. Cromwell, President of the Borough of Richmond, City of New York, all show that the use of high stacks in the instances about which they testify have proved effective. (See pp. 156 *et seq.*, Brief and Argument of Tenn. Cop. Co. on Application for Restraining Order.)

Reference is also prayed to the large number of affidavits of citizens of Fannin and other counties in Georgia, (Supplemental Affidavits Filed by Tenn. Cop. Co.), showing from the personal knowledge and observation of the witnesses that practically no substantial injury has resulted in that state since the erection of the high stacks. This accords with the results of the investigations made by Stochart, who found that a distance of 630 metres (= 690 yards) protects even the tenderest vegetation against the effects of large volumes of vapors, if they escape through chimneys not less than eighty-two feet high. (Lunge's Sul. Acid & Alkili, p. 156.)

One of the favorite proposals of those not familiar with actual conditions is to absorb the gases in water. Anent this, Lunge says:

> "Where, however, there is less than 4 per cent. of sulphurous oxide in the gases any *utilization* is out of the question; the thin acid liquors obtained by washing the smoke must run to waste (which in most cases means an added nuisance and is not permitted by the authorities), nor is the sulphurous oxide anything like completely taken out of the gases."
>
> *Sul. Acid & Alkili*, 3d Ed., p. 373.

He further says (*Ibid*, p. 373):

> "Haworth's U. S. Patent, 268973, of 1882, proposes to condense the sulphurous oxide given off by water and then boiling it out, taking it into lead chambers and therein producing acid is *an economically hopeless process.*"

Another scheme often proposed and as often abandoned is to conduct the gases through limestone, the product being bisulphite of lime. For this salt there is no utilization and, further, the quantity of limestone required is excessive. No less than 1,800 tons daily would be required at Ducktown, which would be prohibitive. In speaking of this process Lunge says, (*Ibid*, p. 374):

> "But unfortunately the expense of this process, where large volumes of gas are concerned, is very serious, more especially as nothing like the whole of the lime can be utilized for absorption, and the attempt to utilize the product as bisulphite of lime has failed."

Speaking of the efforts made to condense sulphur fumes, Peters, in his work, "Modern American Copper Smelting," 2d Ed., p. 58, says:

> "The most elaborate means for obviating this evil have been tried at the great metallurgical establishments of Europe, and vast sums have been expended in this direction. The plans pursued in England tend more toward the mechanical deposition of the offending substances in long flues and passages, (the first experimenters evidently having failed to realize that the sulphurous vapors alone cause the damage), while in Germany, the more scientifically correct method of effecting condensation and absorption of the gases by means of various liquids and chemicals was pursued, but with scarcely better results. In the former case it was soon discovered that, while the oxides of zinc, lead, arsenic and antimony, and various other substances, carried over mechanically or by the draught, were condensed and deposited so completely in the canals that the air issuing

from the top of a tall chimney was practically free from them, the percentage of sulphurous and sulphuric acid, which alone are responsible for damage to vegetation, was not sensibly diminished. Similar efforts in Germany for the absorption of the sulphur gases were carried out with such imperfect and ill-adapted apparatus, and on so inadequate a scale, that the absolute impossibility of a successful issue must be apparent to anyone reading the pamphlet issued by the Freiberg officials intrusted by the government with the execution of the experiments. *But however insufficient the apparatus, the results arrived at decisively indicate the impossibility of disposing of the offending fumes by any plan of condensation or chemical absorption, except on a small scale and with an unusually dilute gas.*"[1]

Affidavit of Mr. John M. McCandless.

In his affidavit, (page 15 Plaintiff's Argument on Leave to File and on Application for Temporary Restraining Order), Mr. John McCandless, State Chemist of Georgia, after assuming a certain annual tonnage of ore for the Tennessee Copper Company, and that the ores contain 30 per cent. of sulphur, and that one-half of it is converted into sulphur dioxide, says there would be 375,000,000 pounds of sulphur dioxide thrown into the atmosphere annually from smelting the quantity of ore he names.

These figures would be correct, provided the assumption as to the tonnage of ore and its sulphur contents is correct. As a matter of fact, however, the Ducktown ores will not average above 25 per cent. of sulphur.

Mr. McCandless then proceeds to suppose that if the air be contaminated with sulphur dioxide in the proportion of one to one hundred thousand, there would be 495,000,000,000,000 cubic feet, or 177.557 square miles of air, one hundred feet in thickness, impregnated with sulphur dioxide in the period of one year.

1 Italics ours.

These figures are, in one sense, correct, but, in another, they are misleading. The proportions above given are estimated by *weight*, whereas, the usual method in measuring air and gases is by *volume*. Indeed, the German authorities quoted by Mr. McCandless, make their estimates by volume. Therefore, his figures, when compared with theirs, are misleading. As sulphur dioxide is about twice as heavy as air, volume for volume, it is plain that one part of sulphur dioxide would go nearly twice as far by weight in contaminating a given quantity of air as it would be by volume. A cubic foot of sulphur dioxide gas, under normal conditions, weighs .1787 of a pound. Divide 375,000,000 pounds by this and the result is 2,098,489,076 cubic feet, or the space the above weight of sulphur dioxide will occupy. If this be diluted with air 100,000 times, or so that 100,000 cubic feet of air will contain one cubic foot of sulphur dioxide the result will be 209,848,907,600,000 cubic feet, or 75,197 square miles of air, one hundred feet thick, instead of 495,000,000,000,000 cubic feet, or 177,557 square miles, as figured by Mr. McCandless on the basis of weight, instead of volume.

The figures given by Mr. Haywood are subject to the same criticism, as they are also based upon weight in stead of volume.

These figures, however, do not furnish any practical demonstration applicable to this case. The gases given off on one day do not, of course, remain suspended in the air awaiting the others to be given off during the remainder of the year; nor do they, either during, or at the end of that period, distribute themselves evenly over any calculated area.

That such figures do not furnish any rational basis of conclusion may also be shown by the following:

In 1905 the quantity of bituminous coal produced in the United States amounted to 315,259,491 tons. A low

estimate of the sulphur contents of this coal is 2 per cent. (See Report of the United State Geological Survey at the Louisiana Purchase Exposition, St. Louis, Mo., 1904, Part 1, pages 196 to 263, wherein it is shown that sixty-nine samples of coal, from practically all the coal-producing states of the Union, carried an average of 2.40 per cent. of sulphur.) This sulphur is almost entirely in the form of iron sulphide, and in burning the coal, practically all the sulphur is given off as sulphur dioxide. Therefore, in one year there is given off from burning coal 25,220,759,280 pounds of sulphur dioxide.

This amount would occupy a space of 141,134,635,031 cubic feet. If mixed with air in the proportion of one part to one hundred thousand, it would "contaminate" 14,113,463,503,100,000 cubic feet, 95,881 cubic miles. Spread this out to a depth of 100 feet in thickness and it would cover an area of 5,062,517 square miles.

The above is calculated by volume. Calculated by weight, as per the method of Mr. McCandless, the territory covered would be, approximately, 11,203,350 square miles in one year, or about 30,694 square miles in one day. The area of the United States is approximately 3,600,000 square miles. Hence, the sulphur dioxide from burning coal alone in one year is sufficient to cover the country three times over, 100 feet thick, in the proportion of one part to one hundred thousand of air, calculated according to the method used by Mr. McCandless and Mr. Haywood.

Moreover, one part to one hundred thousand is not enough to "contaminate" the air. Schroeder, who is quoted by Mr. McCandless in his affidavit, is also quoted by Lunge (*Sulphuric Acid & Alkili*, 3d Ed., p. 155) as saying that from air containing as little as one part of the dioxide to five thousand of air, the gas is absorbed by the leaves of deciduous trees and conifers; but he does not say that this small proportion results in appreciable

injury. Lunge further says, (*Ibid,* p. 156), that other communications on this subject, partly contradicting those of Schroeder, have been made by Stochart, who found that a distance of 630 metres (= 690 yards) protects even the most sensitive vegetation against the effect of large volumes of vapors, if they escape through chimneys not less than 82 feet high. Haywood (Bulletin No. 89, Bureau of Chemistry, U. S. Dept. Ag., p. 12) found that one part in thirty thousand (by weight) injured a potted Australian pine, after being exposed to the fumes eighteen different times in a cabinet. Calculated by volume, the above proportion would be one part in fourteen thousand. Moreover, such a plant is not a tree of the forest, inured to heat and cold. Further, as shown by Mr. Haywood himself, (Bul. 89, p. 9), all plants naturally contain more or less sulphur trioxide, dependent upon the character of the soil in which they are grown. Some are naturally stronger than others and, therefore, more capable of resisting the effects of the fumes. And, unless the condition of the plant, and the quantity of sulphur it naturally carries, be ascertained in advance, the result of such an experiment will necessarily be doubtful, not to mention the probable effect of the difference in the conditions in a closed cabinet and the open air. There is no method of determining the quantity of sulphur dioxide that will injure vegetation in the open air, and this is probably the reason German authorities differ so widely on the subject.

Prevailing Wind-Direction at Ducktown.

The claim has been made that the prevailing wind-direction at Ducktown is from the North, and, therefore, that the fumes are more frequently carried into the territory of Georgia than elsewhere.

Data furnished by the Section Director (Tennessee) of the United States Climatological Service, based upon

observations made at the smelting-works of this defendant at Isabella, and covering the years 1902, 1903, 1904 and 1905, except the month of January, 1902, show that only in one month of the forty-seven (February, 1902,) was the prevailing direction of the winds from the North. Out of the 1429 days, the winds were from the North but sixty-four days. During the entire period they were from the West thirty-eight of the forty-seven months.

THE LAW OF THE CASE.

We think the proof abundantly shows that the defendants are using their properties in the only way possible; that only two methods have ever been known by which ores of this kind can be successfully treated; that the use of either results in more or less sulphur fumes being thrown off into the air, and that it has thus far been found impossible to condense or utilize these fumes. It seems self-evident, on account of the financial considerations involved, that these fumes would be utilized, if it were possible to do so. Yet, no doubt because certain cupriferous pyrites can be and are used in acid-making, the constant claim by those unfamiliar with the subject is made that these monosulphide ores can also be utilized in the same way. It is first argued that it is not done, because it is more profitable not to do it, and then it is urged that it ought to be done, because there is a large profit in it. The simple truth is that, although the defendants and others before them have expended large sums in the effort, and although the defendants in making further effort are now erecting extensive plants, sulphuric acid has never been successfully made from smelting ores of this kind.

Question Presented.

The question presented, therefore, is whether the operations of these defendants, carried on lawfully, according to the best and highest standard of the art, in a re-

mote, mountainous region where the ores are found, and in a district as well-suited to the business as any in reach, shall be enjoined and their property thereby virtually confiscated, or whether they shall be permitted to put their property to the use evidently intended by nature by the only ways and means available to them, and be held responsible only for such injuries as that use may unavoidably inflict on the adjacent proprietors?

Upon the proper decision of this question hangs the destiny of one of the greatest single industries of this country—copper-smelting. While of vast importance to Ducktown, it is of untold importance to the great mines of the West, where proceedings similar to this have been brought in many instances. There, as here, the opening of the mines has brought a large influx of population into what was before a wilderness. And there, as here, people directly dependent upon the working of the mines for the sale of the products of their little farms have brought suit under the mistaken idea that the fumes can be utilized just as well as not.

Distinction Between Natural and Artificial Uses of Land.

As stated in a former brief, a distinction often overlooked in cases of this kind is between nuisances resulting from enterprises which have no relation to the places where they are located, and which may be carried on as well at one place as another, and those whose location at a particular place is made necessary by the character of the earth or its mineral contents. To the first class belong such well-known nuisances as slaughter-houses, tanneries, varnish-plants, fertilizer-works and like noxious enterprises. As a rule, a court of equity will restrain such at the suit of an injured adjoining proprietor, because their location at a particular place is in no way connected with the natural use of the land. They may be located at one place as well as another, in so far as the

nature of the land where located is concerned. To the other class belong such enterprises as fire-brick works, coke-ovens, coal-breakers, coal and iron-ore washers, and the like. In these the nature of the business is usually such as to make it necessary that it be carried on at or near the place where the raw material is taken from the earth.

There are many cases belonging to the latter class where injunctive relief has been denied and the complainants required to rely on their remedy by way of damages. In some, where the business was of a quasi-public nature, even the legal right has been questioned.

If one person owns a tract of land valuable only for its mineral contents, and there is no way by which the minerals can be utilized without doing some injury to the use of adjoining property as a farm or dwelling-place, where is the superior right? Can the adjoining proprietor insist upon his right to use his property in such manner as will prevent the only available use of the other? Is his right to put his property to any use he may see fit any higher or better than the right of his neighbor to put his property to its only available natural use? Or will the natural character of the two places be looked to by the courts in determining the respective rights of the proprietors? It seems clear that each has an equal right with the other to put his property to the highest and best use intended by nature, and if these uses conflict, neither can rightfully claim a higher or better right and enjoin the other, but must accept compensation for such injury as unavoidably flows from the lawful and natural use of the adjoining lands.

The old maxim that everyone must so use his property as not to interfere with that of another was formulated at a period when there were few, if any, enterprises resulting in nuisances that could not be carried on at one place as well as another. To all such the maxim is, as a

rule, properly applicable; but in these modern days of vast industrial development it sometimes happens that the only use to which a piece of property can be put is one evidently intended by nature as shown by its mineral contents, but which cannot be enjoyed without doing more or less injury to adjoining properties. For instance, the opening of coal mines requires that the mine-water be pumped to the surface, where it must, of necessity, flow into the surface drainage of the neighborhood, contaminating the waters to the injury of the lower riparian owners. So with injury from fumes coming from fire-brick works, coke-works and the like, where conditions are such that the materials used cannot be utilized other than on the premises where found.

In old times the class of nuisances the courts were called upon to deal with by injunction were, almost without exception, the kind that have no relation to their sites, such as tanneries, slaughter-houses, varnish plants, and the like. And in modern times the attempt to apply the rules governing such cases to those where the alleged nuisances grow out of a natural use of land has led to confusion and, not infrequently, to injustice. It seems plain that there is a wide distinction in principle between a case where a party, deliberately and as a matter of choice, locates an obnoxious enterprise in a thickly peopled neighborhood, when it could have been, with equal advantage, but possibly at some greater cost, located elsewhere, and a case where the enterprise is, of necessity, located at a particular place on account of the mineral contents of the earth. In the one case the use is artificial; in the other, natural.

This distinction, as well as the one between direct and indirect injury in such cases, was recognized in the case of *Mountain Copper Co. vs. United States*, in the Circuit Court of the United States, Ninth Circuit, (142 Fed. Reporter, 625), where the Court said:

"As has been said, all of them (injuries) are indirect and grow out of the maintenance of an alleged nuisance on its own property. The defendant has not entered upon any of the lands of the complainant and cut down or destroyed any of the trees, timber, or undergrowth thereon, or threatened to do so, as was done in the case of *Northern Pacific Railroad Co. vs. Hussey,* 61 *Fed.,* 231, cited by counsel from this court, and in which we said that to cut down, destroy, or carry away the timber standing upon land in which the complainant had an interest was 'essentially to destroy and take away the very substance of the estate; that an injunction will be awarded in behalf of one showing the necessary interest in the property to prevent such waste and destruction, is thoroughly settled.' There is no doubt of the correctness of that ruling, or of a similar ruling in numerous similar cases cited by counsel of the appellee. The distinction between them and the case now under consideration is sufficiently obvious without elaboration. Here, as has been said, the appellant has never entered upon any of the land of the complainant and cut down or destroyed any trees or underbrush, or otherwise directly interfered with the complainant's freehold. The acts of the appellant that are complained of were all committed on its own property. It is quite true that it is a maxim of the law that everyone must so use his property as not to interfere with that of another. *But where he cannot use his own property at all without indirectly injuriously affecting the property of another, then the sound discretion of the court of equity that is appealed to to abate the nuisance is invoked and should be wisely exercised."* [1]

Legal Right — Equitable Relief.

A distinction often overlooked in the decision of cases of this kind is that between the common law rights of the complainants to damages, and the equitable principles

1 Italics ours.

that apply in controlling a Chancellor in granting or refusing injunctions — between the complainants' legal right to compensation, and the equitable principles that move the Court to weigh all the circumstances in determining whether the complainants are justly entitled to injunctive relief, as well as that by way of compensation.

Many cases seem to have been decided upon the theory that to entitle the complainant to injunctive relief, it is only necessary to show the existence of a nuisance and that he is injured by it. This theory seems to have grown out of the old practice in courts of equity of requiring the legal right in doubtful cases to be first established at law before equitable relief would be granted.

Courts of equity will, as a rule, restrain private nuisances wherever, by the evidence, the right is clear and there is no other adequate redress. Such enterprises as are injurious or disagreeable to adjoining proprietors, and that have no relation to the nature of the place where they are situated, but may be carried on at one place as well as another, will ordinarily be abated at the suit of the injured party. Their location at a particular place is not made necessary by the character of the earth or its mineral contents, and their removal does not deprive the owner of the benefits peculiar to the character of his lands. In such cases the legal right is plain, and, as a rule, the right to equitable relief is also unquestioned; but it does not follow in all cases that the complainant is entitled to this relief because of his legal right. At law legal consequences follow, as rule, regardless of particular circumstances, but the granting of injunctive relief is always at the discretion of the court, even in cases where the location of an enterprise at a particular place is not essential on account of the peculiar character of the land or its contents. In fact, the right to vary the judgment according to the circumstances is the very foundation of equity jurisprudence. It necessarily fol-

lows from the right to exercise discretion in granting or withholding injunctions, that every case must depend upon its own peculiar facts, and that no injunction will ever be granted, no matter how plain the legal right may be, if, under the facts of the particular case, it would be inequitable or oppressive to do so, or against the real justice case, instead of leaving the party to his remedy for compensation at law.

In *Clack vs. White, 32 Tenn., (2 Swan)*, 545, the legal right was admitted and recognized by the court, but an injunction was refused because against the real justice of the case. The court said:

> "It was also admitted in the defendant's answer that the way was opened and that he afterwards closed and obstructed it. So that both the legal title to the way and its obstruction by the defendant appear in the present record; but it does not follow as a corollary that an injunction will lie. The special injunction is not a writ of right, but it rests in the sound discretion of the court; and hence Mr. Story says: 'No injunction will be granted whenever it will operate oppressively or inequitably, or contrary to the real justice of the case.' *2 Story Eq. Jur., Sec. 959.*"

In *Huckenstine's Appeal, 70 Pa. St.*, 103, the nuisance complained of was caused by the smoke and fumes from a brick-kiln, resulting in the destruction of the complainant's orchard and garden and injuring his dwelling. After stating that an injunction does not necessarily follow the establishment of the legal right, the court said:

> "A court exercising the power of a chancellor whose arm may fall with crushing force upon the every-day business of men, destroying lawful means of support, and diverting property from legitimate uses, cannot approach such cases as this with too much caution. Its aid is not of right, but of grace, and it must be sure that the exercise of this kingly power is just, wise and proper, before it takes from a citizen his means of liveli-

> hood, and destroys the value of his property for legitimate uses. And more than this, it must look at the customs of the people, the characteristics of their business, the common uses of property and the peculiar circumstances of the place wherein it is called to exercise the power. In no other way can its justice, wisdom, and propriety be exhibited in adjudicating upon the rights interests and employments of the people subject to its power."

The case of *Susquehanna Fertilizer Co. vs. Malone*, 73 *Md.*, 268, is often quoted as authority for the proposition that the law, in cases of this kind, will not undertake to balance conveniences, or estimate the difference between the injury sustained by the plaintiff, and the loss that may result to the defendant from having its business declared a nuisance. Also, that no one has the right to erect works which are a nuisance to a neighboring owner, and then say that he has expended large sums of money in erecting his works, while the neighboring property is comparatively of little value.

That case, however, was one where the enterprise in question not only had no relation to the character of its location, but it was one in which the legal right alone was asserted; and, of course, the matters above mentioned were wholly foreign to the inquiry and were properly excluded by the court.

Likewise, the case of *Shively vs. Cedar Rapids, etc., R'y. Co.*, 74 *Iowa*, 169, is frequently cited as authority for the proposition that it is no defense to a nuisance that it is necessary to the operation of the business of the one maintaining it.

That was a case where the railroad company maintained stock-yards for the convenience of shippers, within sixty feet of the plaintiff's lot. It became a nuisance, emitting foul and unhealthful odors. The suit was for damages alone, and the action was maintained upon the

ground that it did not appear that the yards could not have been located at another place with equal advantage.

Richards' Appeal, 57 *Pa. St.,* 105, makes special mention of the mistaken idea that the establishment of the legal right also gives the plaintiff the right to injunctive relief. The complainant was a manufacturer of cotton goods and owned a dwelling in a village near the defendants' iron-works. Smoke from the works blackened the goods of the complainant and injured his premises as a dwelling-place. The iron-works were extensive and had been long in operation. The court in refusing the injunction said:

> "An error seems somewhat prevalent in portions, at least, of this commonwealth in regard to proceedings in equity to restrain the commission of nuisances. It seems to be supposed that, as at law, whenever a case is made out of wrongful acts on one side and consequent injury on the other, a decree to restrain the act complained of must necessarily follow, as a judgment would follow a verdict in a common law court. This is a mistake. It is elementary law that in equity a decree is never of right, as judgment at law is, but of grace. Hence, the chancellor will consider whether he would not do a greater injury by enjoining than would result from refusing, and leaving the party to his redress at the hands of a court and jury. If in conscience the former should appear, he will refuse to enjoin." Citing *Hilton vs. Earl of Granville,* 1 *Craig & Ph. Ch. R.,* 202: *The Ohio and Penna. Railroad Co., supra.*

In *Pennsylvania R. R. vs. Merchant,* 119 *Pa. St.,* 541, (4 *Am. St. Rep.,* 659), the nuisance complained of was caused by noise, smoke, dust and cinders from passing elevated trains, causing serious impairment of the rental value of the plaintiff's property. However, the legal right to compensation was denied on the ground that the defendant was making only such reasonable use of its property as was possible, and that the injury was

unavoidable, being inflicted without negligence or malice. The underlying principle was that it was necessary for the road to be located where it was, and that the injury from its operation was unavoidable.

The case of *Tipping vs. St. Helen's Smelting Co.,* 11 *H. L. Cas.,* 650, so often cited as authority in cases of this kind where equitable relief is sought, was one where only the legal right to compensation was asserted. In addition to this, the smelting-works complained of were located in a thickly settled district, where numerous other enterprises were being carried on, and their location at that place had no relation to the nature of the site, or its mineral contents, the ores smelted being mined elsewhere.

In *Hilton vs. Earl of Granville,* 1*st Craig & Phillips,* 298 (18 *Eng. Chan. Rep.*), it appeared that the defendant was making a natural use of his premises by mining the underlying minerals. Several hundred thousand pounds were invested. The operations were threatening to undermine and destroy the plaintiff's dwelling; but as the damage that might result to him if he suffered the injury was susceptible of approximate compensation, and as the stopping of the mining operations by injunction would entail upon the defendant irreparable injury, the injunction was refused and the complainant required to rely upon his remedy at law.

The opinion of the court in *Robb vs. Carnegie,* 145 *Pa. St.,* 324, clearly illustrates the principle that a land owner has equal right with an adjoining proprietor to put his land to the highest and best use to which it is adapted by nature, being responsible only in damages for such injuries as may flow therefrom. The legal right alone was asserted and the recovery of damages was resisted on three grounds:

(1). It was insisted that such injuries were the natural and necessary result of the development by the

owner of the resources of his land, as in *Penn. Coal Co. vs. Sanderson,* 113 *Pa. St.,* 126. This defense was thus answered by the court:

> "In Sanderson's case the land was coal land. Its value could be realized by the owners in no other way than by bringing the coal to the surface, so that it could be prepared for the market. In the process of mining, subterrannean veins of water are necessarily opened, and the water accumulating in the mines must be brought to the surface, where it naturally finds its way into the surface streams and pollutes them. If this could not be done, a great industry would be interfered with, and the owner of the coal land denied the rights of ownership in his land for the benefit of a neighboring owner, whose title was no greater or higher than his own. The maxim, *sic utere tuo ut alienum non laedas,* was, therefore, neither suspended nor modified in Sanderson's case. The coal company was using its own land in the only manner practicable to it. The harm done thereby was the least in amount consistent with the natural and lawful use of his own. If this use was to be denied to the coal company, because some injury or inconvenience to others was unavoidable, then the result would be a practical confiscation of the coal lands for the benefit of householders living on lower ground.
>
> "But the defendants are not developing the minerals in their land, or cultivating its surface. They have erected coke-ovens upon it, and are engaged in the manufacture of coke. Their selection of this site, rather than some other, is due to its location and to their convenience, and has no relation to the character of the soil, or to the presence or absence of underlying minerals. The selection was no doubt a wise one, quite secluded and quite convenient to the several mines from which the material was to be obtained for the making of the coke; but it was the selection of a manufacturing site, and is subject to the same considerations as though glass, lumber, or iron

had been the commodity to be produced, instead of coke. The rule in Sanderson's case has therefore no application to the facts of this case. The injury, if any, resulting from the manufacture of coke at this site, is in no sense the natural and necessary consequence of the exercise of the legal right of the owner to develop the resources of his property, but is the consequence of his election to devote his land to the establishment of a particular sort of manufacturing, having no natural connection with the soil or subjacent strata."

(2). It was claimed that the injuries resulted from a reasonable use by the defendant of his own land for a lawful purpose, as in *Huckenstine's Appeal*, 70 *Pa. St.*, 102. But to this the court replied:

"The rule in *Huckenstine's Appeal* is equally inapplicable. The land of the appellant in that case had upon it a deposit of fire-clay, which could be made into bricks with profit, if it could be done near the pit from which the clay was taken. . . . . An effort was made to enjoin against the burning of the bricks. . . . . The injunction was refused, and it was held that, upon the case as presented, Huckenstine was making a reasonable use of his own land, which equity would not interfere with. Whether he would have been liable in an action at law for any substantial injury he might do in burning the bricks was not before the court and was not considered.

"We think it true, as held by the judge of the court below, that the evidence in this case would not justify an injunction. It shows the selection of a site as well adapted to the business, and as remote from dwellings as any in that region. To enjoin the manufacture of coke at such a site would amount to prohibition of its manufacture, and the destruction of vast allied and independent industries of immense value to the public, as well as those directly engaged in them. An injunction it not of right, but of grace, and will never be issued by a court of equity when it will inflict

> greater injury than it will prevent. In such a case the injured party will be left to his redress at law."

(3). Lastly, it was claimed that the injuries resulted from a lawful calling, conducted in a lawful manner, and that compensation, even, could not be claimed for injuries caused thereby, as was held in *Penn. Ry. Co. vs. Lippincott,* 116 *Pa. St.,* 472; but the answer of the court was that, so far as railroad and turnpike companies and municipal corporations were concerned, they operated their railroads, highways and streets for the benefit of the public, and that individuals could have no right of action for damages caused by the noise, smoke, dust, etc., incident to their operation.

We think it clear, as a matter of principle as well as of authority, that there is a well-defined distinction between cases where the nuisances complained of are caused by enterprises having no relation to the character of their sites, or to the presence or absence of underlying minerals, and those where the injury unavoidably flows from the development by the owner of the natural resources of his property. And in the case at bar, we respectfully submit that if it shall appear that the defendants are making use of the only available means to develop the natural resources of their properties, they cannot justly be deprived of that right, simply because some injury may result to adjacent owners. In such cases compensation is the rightful rule.

The courts have sometimes refused injunctive relief, even where the legal right to damages was plain and where it appeared that the nuisance grew out of a business not necessarily connected with the nature of the land. This has been done where, under all the circumstances, the granting of the injunction would do more harm than good.

The insistence sometimes made that courts of equity

will always grant relief where the injury results from a recurring or continuing nuisance, is not sound. It is frequently claimed, as in this case, that because the alleged nuisance is a recurring or continuing one, the alleged injury is, therefore, irreparable; and that because it is irreparable, injunctive relief will be granted. It seems plain, however, that it is only against such nuisances that injunctive relief would be required; but as such relief is frequently denied, it follows that injury from such nuisances is not necessarily irreparable. Whether it be so or not, like the question of injunction, depends upon all the facts of each particular case.

See Clifton Iron Co. vs. Dye, 87 *Ala.*, 471.

It is also in line with modern decisions to refuse injunctive relief and send the party to a court of law for redress, when, under all the circumstances, damages would be a fairer approximation to common justice between the parties. Cases will arise, like the present one, where it is impossible for the owner to develop and use the natural resources of his property without more or less inconvenience or injury to adjoining owners. In such cases it would be manifestly unjust to grant the latter a form of relief amounting not only to virtual confiscation of the property of the former with all the capital invested in its improvement and development, but also resulting in great injury to those who are directly and indirectly interested in its continued development. In such cases it more nearly reaches the real justice of the matter to require the injured party to accept compensation for such injury as has been done him.

In *Powell vs. Bently & Corwig Furniture Co.*, 12 *So.*, 1085, the nuisance complained of was the noise of a factory. The court said:

> "Although a court of equity in such cases follows precedent, and goes by rule as far as it can, yet it follows its own rules, and among them is

the one that to abate or restrain in case of a nuisance is not a matter of strict right, but of orderly and reasonable discretion, according to the right of the particular case, and hence it will refuse relief and send the party to a court of law, when damages would be a fairer approximation to common justice, because to silence a useful and costly factory is often a matter of serious moment to the state and town, as well as to the owner."

In *Madison et al., vs. Copper Companies*, 113 *Tenn.*, 338, it was sought to enjoin the operations of the defendants in the present case. The following facts and rulings are set out in the court's opinion:

"The following facts are also found: That the total tax aggregate of Polk county for the year 1902 was $2,585,931.43, of which the total assessment of the defendants amount to $1,279,533.00. It is also found that prior to the operations of these companies there lived in the district where the works are located only two hundred people, whereas there are now living in this district, almost wholly dependent upon these copper industries, about 12,000 people.

"It was also found that one of the defendants, the Tennessee Copper Company, employs on its pay-roll 1,300 men, and that the average pay-roll is about $40,000.00 per month, nearly all of which employes have been drawn from Polk and neighboring counties.

"It is further shown that one of the defendants, the Tennessee Copper Company, consumes, approximately, 3,000 tons of coke, 2,800 tons of coal and 1,000 cords of wood per month, and that it purchases and uses 2,100 carloads of coal, coke, etc., per annum. In the year 1901 it purchased and used, approximately, 1,100 carloads of cordwood, cross-ties, lumber and quartz. It was also found that eighty per cent. of these supplies were purchased from and delivered by citizens of Polk county. The aggregate paid out for supplies is not stated by the Court of Chancery Appeals, and

cannot here be stated accurately; but certainly the amount is very large. And it is seen from the figures that one of the defendants, the Tennessee Copper Company, pays out annually in Polk county nearly a half million dollars. The Court of Chancery Appeals finds that the other company employs between 1,100 and 1,200 people, and from this it may be inferred that that company pays out annually for wages and supplies nearly as much as the Tennessee Copper Company.

"It is quite apparent that the two companies pay out, annually, vast sums of money, which are necessarily of great benefit to the people of the county, and that they are conducting and maintaining an industry upon which a laboring population of from 10,000 to 12,000 are practically dependent; and it is found in substance by the Court of Chancery Appeals that if these industries be suppressed, these thousands of people will have to wander forth to other localities to find shelter and work."

On the question as to methods of treating the ores, the court said:

"The defendants cannot reduce their ores in a manner different from that they are now employing, and there is no more remote place to which they can remove. . . . . We are deeply sensible of the truth of the proposition that no man is entitled to any more rights than another on the ground that he has or owns more property than another. But in case of conflicting rights, where neither party can enjoy his own without in some measure restricting the liberty of the other, the law must make the best arrangement it can between the contending parties, with the view of preserving to each one the largest measure of liberty permissible under the circumstances."

The court, after laying down the doctrine that the right to compensation in such cases is absolute where injury is shown, but that injunctive relief is a matter of sound discretion under all the circumstances, said:

> "The question now to be considered is, what is the proper exercise of discretion under the facts appearing in the present case? Shall the complainants be granted in the way of damages the full measure of relief to which their injuries entitle them? Or, shall we go further, and grant their request to blot out two great mining and manufacturing enterprises, destroy half of the taxable value of a county, and drive more than 10,000 people from their homes? We think there can be no doubt as to what the true answer to this question should be."

We respectfully dissent from the view taken by plaintiff's counsel (page 4 of Plaintiff's Argument on Leave to File and for Temporary Restraining Order) that the Supreme Court of Tennessee, in deciding the above case, "begs the question of injunction and uses the discretion alleged to have been granted it under a Tennessee statute to assert, in effect, the right of eminent domain in the copper company."

The Code of 1858, section 3403, provided that in suits at law for damages resulting from a nuisance, and the finding that the matter complained of was a nuisance, the court had the power, upon petition of the plaintiff, to abate the nuisance, without resort to the chancery court for that purpose.

The object of that statute was to give the circuit court jurisdiction to abate nuisances after a jury had declared them to be such.

The amendatory act of 1901, chapter 139, simply provides that after the matter complained of as a nuisance is found to be such, "the court exercising sound discretion may, upon petition of the plaintiff, order or decline to order the nuisance to be abated."

The object of this amendatory statute seems mainly to have been lodge power with the circuit court to look to the public utility of an alleged nuisance in determining whether it should be abated or not. The caption of

the act implies that such power is intended, although the body of the act is not explicit. Chancery courts had always exercised such discretion, and it seems that the main purpose of this act was to clothe the circuit courts with the same discretion, inasmuch as they, as well as the chancery courts, had the power, under the statute, to abate nuisances.

At all events, it is plain from the authorities cited by the Supreme Court in the above case, as well as from its reasoning, that the court based its decision upon the inherent power of a court of equity to look to all the facts and circumstances and exercise its sound discretion in determining whether a given nuisance shall be abated or not. The court simply accepted the above act as declarative of the legislative policy, and as simply confirming the principles already governing courts of equity in such cases, at the same time conferring like power on the circuit courts.

This statute is discussed in the case of *Mountain Copper Co. vs. United States*, above cited, and the court there held in substance that it in no way affects the rule of discretion always heretofore followed in cases of this kind.

Public Interests to be Considered.

A court of equity, in passing upon the question of equitable relief in a case like this, will consider not only the relative advantages and disadvantages to the parties themselves, but will also look to the interests of the public. In *Clifton Iron Co. vs. Dye*, 87 *Ala.*, 471, the court said:

> "Counsel have pressed the proposition that mere convenience in the use of its property by the company does not entitle it to pour down upon the appellant's land, and into the stream on his land, the debris from the washers erected by it, and we think the contention is reasonable. But it is not every case of nuisance, or continuing trespass,

which a court of equity will restrain by injunction. In determining this question, the court should weigh the injury that may accrue to the one or the other party, and also to the public, by granting or refusing the injunction. . . . . .

"The court will take notice of the fact that in the development of the mineral interests of this state, recently made, very large sums of money have been invested. The utilization of these ores, which must be washed before using, necessitates, in some measure, the placing of the sediment where it may flow into streams which constitute the natural drainage of the section where the ore-banks are situated. This must cause a deposit of sediment on the lands below; and whilst this invasion of the rights of the lower riparian owner may produce injury, entitling him to redress, the great public interests and benefits to flow from the conversion of the ores into pig metal should not be lost sight of. As was said by the Vice-Chancellor in *Wood vs. Sutcliffe, 2 Sim. N. S.*, 162, "Whenever a court of equity is asked for an injunction in cases of such nature as this, (a bill to enjoin the pollution of a stream), it must have regard, not only to the dry, strict rights of the plaintiff and defendant, but also to the surrounding circumstances."

In *Wilder vs. Strickland, 2 Jones Eq.*, 391, the court said:

"If upon such evidence as is offered by the plaintiffs, the court will interfere to restrain the building of a mill, it must be built in a wilderness where there is no one to be injured, either in health or property; for it must needs be that in a thickly settled neighborhood someone must be injured in some way or the other. . . . . Should the fears, real or assumed, of the plaintiffs, as to the effects of the proposed mill upon the health of their respective families, be realized, they will not be without redress. The courts of law will be open to them, and they will go into them with more grace, having by these proceedings put the defendant on his guard."

In the case of *Chartier Block Coal Co. vs. Mellon,* 18 *L. R. A., 707,* the court said:

> "In such cases, the public might be debarred the use of the hidden treasures which the laboratory of nature has provided for man's use in the bowels of the earth. Some of them, at least, are necessary to his comfort. Coal, oil, gas and iron are absolutely essential to our common comfort and prosperity. To place them beyond the reach of the public would be a great public wrong. Abounding as our state does with these mineral treasures so essential to our common prosperity, the question we are considering becomes of quasi-public character. It is not to be treated as a mere contest between A & B over a little corner of the earth. . . . . It is familiar law, too familiar to need citation of authority, that the decree of a chancellor is of grace, not of right, and that he is not bound to make a decree which will do more mischief and work far greater injury than the wrong which he was asked to redress."

We reverently insist that nature has determined the relative rights of men to the possession and use of the earth by varying the conditions and adaptabilities of every locality on its surface, and the deposit in special places of minerals and metals essential to human comfort and progress; and any law attempting to confer individual rights superior to these would be unnatural and artificial. The right to the exclusive and unmolested use of any part of the surface of the earth is an artificial right given by law; it is not one of the natural rights. And the law, as a rule, gives damages for its wrongful invasion to the full extent of the injury inflicted. But it is a relative right. The owners of the adjoining lands have an equal right to their use according to their nature; and there is still the paramount public good to which all private interests must yield on compensation being made. But we respectfully insist that the right of

the owner to develop the natural resources of his land is equal, if not superior to the right of an adjoining owner to put his property to some artificial use; and if these uses conflict, the latter cannot rightfully enjoin the former, but must accept compensation for such injury as is unavoidable from the natural use by his neighbor of his property.

In *Hughes vs. Anderson,* 68 *Ala.,* 284, the court held that even natural rights must sometimes yield to the general good, as follows:

> "So, as a rule, every man must so enjoy his own property as not to offend his neighbor's equal right to enjoy his own unmolested; but this cannot be enforced in its strict letter without impeding rightful progress, and without hindering industrial enterprise. Hence, mere individual interest is sometimes made to yield to a larger and paramount good. To deny this would be to withhold from the world the inestimable benefits of discovery and progress in all the great enterprises of life. The rough outline of natural right or natural liberty must submit to the chisel of the mason that it may enter symmetrically into the social structure."

Case of Godfrey, et al., vs. American Smelting & Refining Company, et al.

The case of *Godfrey, et al. vs. American Smelting & Refining Co., et al.,* in the Circuit Court of the United States, District of Utah, was decided November last, but thus far we have not found it reported.

The complainants, four hundred and nine in number, filed the bill against the above-named defendant and four other smelting companies, all having their plants in the same locality. The object was to enjoin the defendants' roasting and smelting operations, the fumes from which were alleged to contain arsenic, sulphur, etc., resulting in injury to property and health.

A decree was passed enjoining the defendants from further roasting and smelting, at the place their works were then located, any sulphide ores containing more than ten per cent. of sulphur, and from discharging into the air any arsenic, etc. It was provided, however, that the defendants might apply for a modification of the injunction upon any showing the court might deem sufficient.

That case is distinguishable from the present one in some important particulars.

In the first place, it appears that the defendants were primarily smelting companies, buying their ores, or a good portion of them, from various mining companies there and elsewhere, and shipping them to their works. The opinion of the court itself does not directly so state, but, in the defendants' brief accompanying it, it is stated that some ten or twelve mining districts would be seriously affected by the shutting down of the defendants' smelters and from this it is inferred that the ore supplies were largely drawn from mining companies operating in these outlying districts.

Another important fact is that it does not appear that the defendants made any contention that there was no other locality in the region suited to their operations. In other words, it was not contended that the business could not, with equal advantage, have been carried on at some near-by place where no injury would result to the farming interests. So far as appears from the facts stated in the opinion, the selection of the site of the defendants' smelters was a matter of choice, and had no relation to the presence or absence of underlying minerals. We regard this as a vital point of distinction between that case and this.

In that case one of the authorities relied on by the court as controlling, and quoted from at length, is *Sullivan vs. Jones & Laughlin Steel Co.*, 208 *Pa. St.*, 540, (57

Atlantic, 1065). While it may have been applicable as authority in the Godfrey case, on account of the fact that the site of the smelting-plant was a matter of choice, we respectfully submit that its reasoning is unsound when applied to the present case.

In the Sullivan case the defendant had, for many years, operated a steel plant in the city of Pittsburg, and in proximity to the plaintiff's premises; but shortly before the commencement of the suit, the furnaces had been enlarged, and the character of the ore smelted so changed, as to materially increase the injury inflicted on the plaintiff. The controlling point in the case is that the furnaces were rebuilt and enlarged, their site being in a populous part of the city, when they could have been rebuilt in a more remote place with equal advantage, except, perhaps, the additional cost of procuring a new site. It does not appear that they were rebuilt on the old site because the ores smelted were mined there, or because of its having any other peculiar advantage or value as a furnace-site. It was simply one of the very great number of cases where the enterprise had no relation to its site, and that could have been carried on at one place as well as another. And, under the facts, it is not questioned that the maxim, "*Sic utere tuo ut alienum non laedas*" would properly apply, and that the injunction was properly granted.

While we think the court's conclusion, under the particular facts of that case, is sound, we do not think the views put forward in support of it entirely correct.

In that case the principle, that a decree in equity is not of right, but of grace, and that a chancellor will never enjoin whereby so doing, a greater injury will result than from a refusal to enjoin, is attacked. It is stated that the phrase "of grace" had its origin in an age when kings dispensed their royal favors by the hands of their chancellors, but that it has no rightful place in the

jurisprudence of a free commonwealth, and ought to be relegated to the age to which it was appropriate. And from this the court naturally and inevitably drifts to the position that when the legal right is clear, the remedy by injunction follows, as a matter of course.

Further, no distinction is made between injuries resulting from negligence or malice, and those that result indirectly or consequentially from the development by the owner of the natural resources of his land; unless by the use of the expressions, "artificially using" and "artificial use," in the quotation below, the court meant to imply that where the use was natural, the principles laid down would not apply. The court said:

> "Nor can it make the slightest difference that the plaintiff's property is of insignificant value to him as compared with the advantages that would accrue to the defendants from its occupation. There can be no balancing of conveniences, when such balancing involves the preservation of an established right, though possessed by a peasant only to a cottage as his home, and which will be extinguished if relief is not granted against one who would destroy it in artificially using his own land. . . . . The right of a man to use and enjoy his property is as supreme as his neighbor's, and no artificial use of it by either can be permitted to destroy that of the other."

Laches.

We respectfully submit that, as to this defendant at least, the plaintiff is estopped by laches from claiming injunctive relief; and we believe it should be so as to the other defendant by reason of the fact that it was largely at the plaintiff's instance that the high stacks, of which it now makes special complaint, were erected and put in use.

The proof shows that the defendant Ducktown Sulphur, Copper & Iron Company, Limited, began active

roasting and smelting operations in 1893. For a period of nine years its roasting operations were carried on at a place about two miles from the nearest point on the Georgia line. The most material change since the defendant began work in 1893 was one favorable to the plaintiff, namely: the change of location incident to the abandonment by this defendant of open-heap roasting in 1902. Since that date all of this defendant's operations have been carried on at its smelting-plant at Isabella, which is between three and four miles from the Georgia line.

As elsewhere shown, during the nine years of the roasting operations above mentioned, only five owners of land in Georgia filed complaints on account of alleged injury from the fumes, and since then no complaint has been filed by any land-owner of that state. (See affidavit of W. H. Freeland, Answer of D. S. C. & I. Co. to Rule to Show Cause, page 20.) And it is fully shown by proof hereinafter cited that the alleged injury that was made the basis of the complaints mentioned was wholly intangible.

Thus it is seen that, during a long period, covering many years before the filing of the bill in this case, this defendant carried on the operations now complained of without objection, protest, or suit on the part of the plaintiff. If these operations are doing injury now, when they are so much further removed from the territory of Georgia than formerly, it is evident that they must have done so, even to a greater extent, when they were carried on much nearer than now. As a matter of truth, however, they have never at any time resulted in appreciable injury in that state; but if so, it was certainly so long ago as that the plaintiff's laches ought, in good conscience, to operate as a bar to the extraordinary relief now sought.

In *Madison vs. Tennessee Copper Company, et al.,*

the Supreme Court of Tennessee held that the complainants in the bill filed against the defendant Ducktown Sulphur, Copper & Iron Company, Limited, were barred, and that their bill could not be maintained, because of their laches. The court said:

> "We are of the opinion that the complainants in the first bill are estopped to claim equitable relief against the defendant thereto by their laches. It is clearly to be inferred from the facts found by the Court of Chancery Appeals, and, as above noted, that these complainants had been suffering these injuries now complained of for ten years when the bill was filed, without making any complaint of them in any form. In the meantime the defendant had expended several hundred thousand dollars in making improvements in the plant, and the nature and source of the injury were such that the complainants could not be mistaken as to the cause or extent of it. Under such circumstances we are of the opinion that it would be inequitable to grant the severe remedy of injunction, but that the said complainants should be left to their actions for the damages."

The court then cited a long line of authorities sustaining the proposition that the equitable remedy by injunction must be applied for with reasonable promptness. In *Powers' Appeal*, 125 *Pa. St.*, 186, the court held:

> "The maxim of the common law, that wherever there is a right there is a remedy for its infraction, has never been adopted in courts of equity. A party whose right is clear may sleep upon it until his demand becomes stale. He may look on while valuable structures are erected, when he might successfully object; and remain silent until large sums have been expended, or important intervening interests have grown up. In such cases, the fact that he might have objected at the outset will not avail him. A suitor must not only appear in a court of equity with clean hands, but he must come with reasonable promptness, in good faith,

and with a just and equitable demand; otherwise the conscience of the chancellor will not be moved. If an injunction is prayed for, where, upon consideration of the whole case, it ought not in good conscience to issue, a mere legal right in the plaintiff will not move the chancellor."

In *Williams et al., vs. The Earl of Jersey*, 1 *Craig & Phillips*, 91, (18 *Eng. Chy. Rep.*), the bill charged that the defendant knew or was aware of the works being erected with the view of smelting copper, and of the deleterious effect produced by such manufacture on vegetation; but that, nevertheless, he allowed complainants to proceed with erection of the plant without objection or complaint, and had acquiesced and encouraged the same. It was also alleged that since the works were started in 1829, they had been operated without interruption or disturbance until the suit brought by the defendant for damages, which the bill was filed to enjoin. The suit was enjoined, the court saying:

"Now, there certainly are cases in which a party, having an equity, loses that equity as against another person, by permitting him to go on dealing with property in ignorance of such equity. In the case of Jones vs. The Royal Canal Company, Lord Manners went to this extent: He held that it was the duty of a party, seeing a nuisance in progress, to give notice to the party erecting the nuisance of his intention to object. It is unnecessary to say under what circumstances a party might be affected by that course of conduct, but certainly it is a recognition by Lord Manners that such a case might exist. There is a very short note of the decision, but, assuming the note accurately to state what Lord Manners said, it shows a case in which a party would be precluded, by an omission to give notice, from asserting an equity. Certainly it is a different question whether such an omission would give the adverse party an equity to prevent the party concealing his right, or apparently acquiescing

in the nuisance, from asserting his title at law for compensation for the nuisance when effected. But there are two cases in which that has been done. I mean the case of the Watercourse, and that of *Short vs. Taylor*, both reported in 2 *Equity Cases Abridged*, 522, where injunctions were granted to stay actions for nuisances, because the plaintiffs at law had encouraged them. That is the term used by the court. I think it impossible, after these two cases, to say that a party may not so encourage that which he afterwards complains of as a nuisance, as not only to preclude him from complaining in this court, but to give the adverse party a right to its interposition in the event of his complaining of the nuisance at law."

Standing by three years without complaint was held to estop the plaintiff in *Clifton Iron Co. vs. Dye*, 87 *Ala.*, 471. The court said:

"But there is another ground which is fatal to complainant's right in a court of equity. The bill in this case was filed September 7th, 1886, more than three years after the first washer was erected. Complainant saw the effect of it on the stream, and made no objection thereto. The company then erected the second washer in 1884, and nearly two years elapsed before relief was sought. Clearly, it was the duty of the complainant to give the company some intimation of his objection, and not stand by with full knowledge and permit it to make large outlays on these washers, and then seek the aid of a court of equity to arrest their operations. Reasonable diligence in the assertion of his rights was the measure of complainant's duty in this case; and, failing in this, he must now seek relief in a court of law for any damage he may have suffered."

In *Sheldon vs. Rockwell*, 9 *Wis.*, 162, the bill was filed to enjoin the restoration of a mill-dam that had washed away. The mill had been built and operated for years, and the dam had before been washed away and rebuilt.

Stating the facts and equitable rules applicable, the court said:

> "During all the time the plaintiff resided in the immediate neighborhood, and upon the premises for injury to which he now complains. With the exception of a verbal notice to the defendant at the time the dam was originally built, that its erection would be an infringement on his rights, he remained all the time a calm and constant observer of every step taken, and every movement made by the defendant, without one word of complaint or warning. He commenced no suit; consulted no attorney. No fraud, misrepresentation, or unfair dealing on the part of the defendants is alleged. No accident, mistake, or excuse for the delay on his part is set up. After nineteen years of profound sleep, he seems suddenly to have awakened to a sense of his position, and finding the dam, for a fifth time swept away by high water, and the defendants engaged in replacing it, the same as before, he asks a court of equity that the defendants be restrained. A statement of these facts constitutes the strongest refutation of his claim for relief.
>
> "The granting or refusing of injunctions rests in the sound discretion of the court. They are never granted when they are against good conscience, or productive of hardship, or public or private mischief. The plaintiff, by his silence and acquiescence, has invited and encouraged the defendants to expend their time and means in the construction and repairing of the dam and the mills and machinery used in connection with it. In them they have a large pecuniary interest; and though they may have erected them for the purpose of private speculation, they are, nevertheless, entitled to the consideration of the court. The public have a large interest in the improvements created by their capital and enterprise."

The court further said:

> "If in England two years' acquiescence defeats a proceeding like the present, how much less de-

> lay ought to suffice for that pupose in a newly settled country like our own, where by the rapidity of our growth and enterprise, a few months oftentimes determines the destinies of our cities, villages and places of business? The diligence required by the law ought to be measured by the mischief which would ensue from a want of it."

A long line of American and English cases are cited in support of these principles.

In *Ware vs. Regent Coal Co.*, 3 *D. & J. (Eng. Ch. Rep.)*, 230, it was said:

> "Upon the question whether the injunction should be granted, I cannot avoid being influenced by the delay which has occurred in the institution of proceedings by the plaintiff, which, though not amounting to absolute proof of acquiescence, ... compels me to weigh the amount of inconvenience which he will sustain by my refusal of this particular remedy against the serious consequences which might result to the company from an order which will oblige them to alter the state and condition of their works."

In *Stewart Wire Co. vs. Lehigh Coal & Nav. Co.*, 203 *Pa.*, 479, it was said:

> "Again, the laches of appellant in instituting this proceeding, though not raised in the pleadings and not discussed in the hearing below, as stated by the learned judge, cannot be overlooked, for, under the facts of this case, it, without more, is in the way of equitable relief. Relief by injunction is not controlled by arbitrary or technical rules, but the application for its exercise is addressed to the sound discretion of the court. Where a party seeks the intervention of a court of equity to protect his rights by injunction, the application must be seasonably made, or the right may be lost, so far as equitable intervention is concerned. It is a rule practically without exception that a court of equity will not grant relief by injunction where the party seeking it, being cognizant of his rights, does not take those steps

> to assert them which are open to him, but lies by and suffers his adversary to incur expenses and enter into burdensome engagements, which would render the granting of an injunction against the completion of his undertaking, or the use thereof when completed, a great injury to him. A suitor who by his laches has made it impossible for a court to enjoin his adversary without inflicting great injury upon him, will be left to pursue his ordinary legal remedy. This rule is especially applicable where the object of the injunction is to restrain the completion or use of public works, and where the granting of the injunction would operate injuriously to the public, as well as the party against whom the injunction is sought."

The Business Lawful.

The court in *Mountain Copper Co. vs. United States*, 142, *Fed. Rep.*, 625, which was a case involving practically the same questions as this case, said:

> "No one, we apprehend, will contend that the smelting of copper ores is, in and of itself, unlawful. On the contrary, it has become of the most useful and necessary employments, especially since the use of copper, in its manifold forms, has increased so enormously, to the benefit, not only of those actually producing it, but to the state, nation and the world at large."

The mere fact that some injury may result from a business, does not render it unlawful in the sense that equity will interfere to enjoin it. If so, then in every case of injury, where the legal right to compensation is made clear, the right to injunctive relief would follow; but it is the well-established usage of courts of equity, where the granting of an injunction is against the real justice of the matter, to require the complainant to rely upon his legal remedy. And in all such cases the injury is not considered irreparable, although it may be a recurring one, nor is the legal remedy considered inad-

equate, if, under all the circumstances of each particular case as it arises, compensation more nearly approximates justice to all parties than would equitable relief.

SPECIAL FACTS AS TO THE DUCKTOWN COMPANY.

While we earnestly insist that the facts do not warrant the granting of an injunction against either of the defendants in this case, there are special facts relating to the Ducktown Sulphur, Copper & Iron Company, which we desire to bring to the attention of the court.

It is shown that this defendant went into the Ducktown district in 1891. About two years were spent in making various tests and experiments, having for their object the utilization of the sulphur and iron contents of the ores.

Open-heap roasting was begun in 1893. These roasting operations were carried on continuously until August, 1902, a period of nine years, at a point locally known as Cartertown. The smelting-plant was located at Isabella, where it is now. The roast-yards were about two miles from the Georgia state line, while the smelting works are something over three miles from it.

> Aff. W. H. Freeland, pp. 18-19, Ans. D. S. C. & I. Co. to Rule to Show Cause; Aff. J. M. Center, p. 28, same; Aff. D. M. Stuart, p. 32, same.

In 1902 this defendant's general manager perfected the present pyritic-smelting process, which obviates the necessity of open-heap roasting. Open-heap roasting was abandoned in August, 1902, and since that time all the fumes generated by this defendant have come from its smelting-works at Isabella.

During the nine years this defendant carried on its roasting operations at Cartertown, only five persons owning land in Georgia filed complaints on account of alleged injuries from the fumes. The lands of four lay

just beyond the state line, while those of the fifth lay partly in both states. Four good citizens testify that they made a thorough examination of the lands in question, but found no injury whatever. This was in May, 1901, about the time the Tennessee Copper Company began open-heap roasting upon a much larger scale than this defendant. Since this defendant abandoned open-heap roasting in 1902, no complaint has been filed against it by any citizen of Georgia.

> See affidavits of M. T. Fouts, pp. 35-36, Answer of D. S. C. & I. Co. to Rule to Show Cause; B. P. Rollins, pp. 40-41, same; G. C. Parks, pp. 46-47, same; W. H. Freeland, pp. 20-21, same; J. M. Center, pp. 29-30, same.

Another witness testifies that he owns lands about three miles from the defendant's smelting-works, but which are nearer the site of the old roast-yards; that while roasting was being carried on at Cartertown some injury was done to vegetation on his lands, but that since the operations have been carried on altogether at the defendant's smelting-works, no injury whatever has resulted.

> Aff. D. M. Stuart, p. 33, Ans. to Rule to Show Cause.

It is thus shown that during the period of nine years, when the defendant's roasting operations were being carried on within about two miles of the Georgia line, there were only five complaints, and these are shown by positive and credible testimony to have been based on no tangible injury. Now that, during a period of over four years, the defendant's operations have been carried on a mile or more further away from the territory of Georgia, and under the most approved method, without a single complaint being filed, it is a fair inference that the fumes coming from the present works are not contributing in any appreciable degree to any injury

in that state. Indeed, it may be noted that in the report of the commission, appointed by the governor of Georgia in 1905 to make an examination into conditions at and near Ducktown, which report was made the basis of this suit, no complaint is made of this defendant, its name not even being mentioned.

Further, we fail to find any proof in the record that in any way tends to show that the operations of this defendant have caused, or materially contributed to any injury in the State of Georgia since the Tennessee Copper Company came into the field. It is conclusively shown that no injury had resulted from them in that state prior to that time. The burden rests with the plaintiff to show by satisfactory proof that they have caused, or materially contributed to substantial injury since. For, none having been done prior to that time, and it being admitted that this defendant's furnace capacity has not been increased, the presumption is that none has been done since.

We respectfully submit that such an important fact, so materially affecting this defendant's rights, will not be taken for granted. The issue on this point was made both in this defendant's answer to the rule to show cause and in its answer to the bill, it being denied that the fumes coming from this defendant's works have, at any time, caused, or materially contributed to injury in that state. So far as we can see, no attempt has been made to meet the issue with proof. A few witnesses mention having seen a column of smoke arising from the defendant's works. That is doubtless true. It has been so ever since the defendant began work. Sulphur dioxide, however, is invisible, and the smoke seen, and whose peculiar characteristics are described by so many hundreds of the plaintiff's witnesses, was doubtless coal smoke. If it were shown that during the nine years prior to the time the Tennessee Copper Company began operations

tangible injury had been done in Georgia by this defendant's fumes, it might possibly be assumed that the injury continued; but it being affirmatively shown by credible proof that such was not the case, and it also being shown that since that time the operations have been carried on fifty per cent. further away, and by the most approved methods, we respectfully submit that the plaintiff cannot reasonably ask the Court to assume that this defendant is doing injury where it had not done it before, and upon such mere assumption, close down this defendant's works and bankrupt it.

CONCLUSION.

We respectfully submit that, even if this suit could be maintained in the plaintiff's own right, or upon the theory that the plaintiff, in a case of this kind, stands in the relation of *parens patriae*, trustee, or guardian of the few of its citizens who claim to be injured, the facts do not warrant the granting of an injunction, the effect of which would be to render the mining properties practically valueless by depriving the defendants of the right to develop their natural resources in the only known way, destroying not only the investment of millions by the defendants, but perhaps an equal amount invested by others in business and in homes, the value of which directly depends upon the working of the mines. It would result in the practical depopulation of a thriving industrial centre of twelve thousand people which has grown up in a district located in a sterile mountain region and in which the mining interests are vastly paramount to all others combined. It is also to be remembered that, with the exception of the period from 1879 to 1891, operations have been carried on there for over fifty years. Following their predecessors in title, the defendants, in the exercise of their supposed rights and without let, hindrance, or protest, have gone along laying out and in-

vesting large sums in the development of their properties, using in the treatment of their ores only the processes that have always been used there.

It is clearly shown by the proof that the region is unfit by nature for ordinary agricultural uses; that the timber of the original forests was of little value for lumber; that, for use in former operations, it had been cut for a distance of ten to fifteen miles from the mines, while the young growth that afterward sprang up in its place has been used as cord-wood in the more recent operations. It will thus be seen that there is little or no timber within reasonable distance to be injured. It is scarcely believable that the sulphur dioxide generated at Ducktown, its specific gravity being twice that of air, could have caused the wide-spread injury claimed over this, and the even greater area mentioned in the bill. It is undoubtedly true, as found by Dr. Schenck and others, that the greater part of the injury attributed to the fumes is really due to the ravages of diseases, insects, forest-fires, etc. It is also a circumstances worthy of note that if the injury were anything like that claimed, it is reasonable to suppose that there would have been a deluge of damage suits, the Courts of Tennessee, as well as the Federal Courts, being open to the injured for the redress of their grievances.

It is shown beyond dispute that the defendants are working their properties in the only way by which their natural resources can be made available. It is fully shown by expert testimony of the highest character that ores of the kind being worked have never been found available for acid-making, while not one syllable of proof is adduced by the plaintiff to the contrary. The plaintiff starts with the assumption that these ores can be utilized for this purpose, and then gives considerable data as to the uses to which the acid can be put, its market value, etc., but no witness acquainted with the subject testifies that these ores are adapted to this purpose.

It is also likewise shown that there is no practical way of condensing these fumes so as to render them innocuous. It is also shown by the testimony of several expert witnesses, as set out in the Brief and Argument of the Tennessee Copper Company, as well as by the reports of various tests and experiments set out by Lunge in his work on Sulphuric Acid & Alkili, that the most practicable method of dealing with these fumes is that now being used by the defendants; namely, by carrying them into the higher strata of the atmosphere through stacks and chimneys, whereby they become so diluted before reaching the ground as to be practically harmless under ordinary conditions.

We respectfully submit that under the circumstances the injury, if any, is unavoidable. The business is a lawful one. It is being conducted not only in a lawful, but the only possible way. It cannot be said to be unlawful, as is held in some cases, simply because some injury may result. If so, then in every case where an enterprise results in injury, it would have to be held unlawful; and the establishment of the legal right to compensation, however trifling, would perforce entitle the plaintiff to injunctive relief. This would rob courts of equity of the cherished discretion to look to all the facts in a case like this, and, even though the legal right may be plain, to withhold an injunction if the granting of it would be against the real justice of the case. Courts of equity would cease to be courts of enlightened conscience and would become engines of oppression and obstruction to all public progress.

It is not disputed, of course, that a party who is injured is entitled to compensation. It is sometimes said, however, (as in *Sullivan vs. Jones & Laughlin Steel Co., supra,*) that it can make no difference that the defendant is able and willing to pay damages for such injuries as he may inflict. This is quite so in cases where the nuis-

ance complained of is an enterprise in no way related to the mineral contents of its site, and which may be enjoined without depriving the owner of benefits peculiar to his land; but, in a case like the present one, the ability of the owner to pay for such damages as he may inflict is the strongest sort of proof that the natural resources of his land are vastly greater than the amount of injury that will result from their development, and that in equity and good conscience he ought not to be deprived of them, simply because some injury may unavoidably result to others. His right to enjoy the natural uses of his land is equal to that of the others. Where these equal rights unavoidably conflict, neither should have the right to virtually confiscate the other's property by injunction, but each should be required to accept compensation for such injuries as unavoidably flow from the natural use by the other of his own property.

Wherefore, we respectfully submit that this suit cannot be maintained by the plaintiff, either in its own right, or as next friend of a few of its citizens. If mistaken in this, we further submit that the alleged injury, if any, is so trifling in its nature and extent, when compared with that which would result from the granting of an injunction, the Court should decline the relief sought.

Respectfully submitted,

JAMES G. PARKS,
Attorney for Defendant.

EXHIBIT A.

Copy of Letter From the Acting Director of Census.

Office of The Director.

DEPARTMENT OF COMMERCE AND LABOR.

Bureau of the Census.
Washington.

January 24th, 1907.

Mr. James G. Parks,
Cleveland, Tennessee.

Dear Sir:

In compliance with your request of the 22nd instant, I furnish the following statement showing the number of fertilizer manufacturers in the states you name, the quantity of sulphuric acid used, the quantity purchased, and the quantity made and consumed in the establishments where manufactured. The figures contained in this statement are obtained from the reports made for the census of 1905, which covers the calendar year ending December 31, 1904. They are preliminary and subject to such corrections as a further examination of the reports may require.

NUMBER OF FERTILIZER FACTORIES AND QUANTITY OF SULPHURIC ACID USED.

STATES.	Number of Factories.	Total Number of Tons Sulphuric Acid.	Tons of Sulphuric Acid Purchased.	Tons of Sulphuric Acid Made and Consumed.
Total..	141	425,899	23,688	402,211
Alabama..	19	46,296	11,375	34,921
Florida..	8	7,300	100	7,200
Georgia..	57	174,361	3,443	170,918
North Carolina	27	59,454	20	59,434
South Carolina.	20	82,462	1,595	80,867
Tennessee..	10	56,026	7,155	48,871

Very respectfully,

W. S. ROSSITER,
Acting Director.

EXHIBIT B.

Copy of Letter From the Acting Director of Census.

Office of The Director.

DEPARTMENT OF COMMERCE AND LABOR.
Bureau of the Census.
Washington.

December 22, 1906.

Mr. W. H. Freeland, General Manager,
The Ducktown Sulphur, Copper and Iron Co.,
Isabella, Tennessee.

Dear Sir:

Referring to your letter of the 18th instant, I send you under separate cover a marked copy of Census Bulletin No. 57, which shows the quantity of sulphuric acid manufactured, also the quantity consumed in the manufacture of fertilizers in the United States.

The following statement shows the number of fertilizer manufacturers and the number that make sulphuric acid for their own use in each of the States you enumerate:

NUMBER OF FERTILIZER FACTORIES AND NUMBER OF SUCH FACTORIES THAT MANUFACTURE SULPHURIC ACID FOR THEIR OWN USE AS REPORTED FOR THE CENSUS OF 1905.

STATES.	Number of Fertilizer Factories.	Number of Fertilizer Factories That Make and Consume Their Own Acid.
Alabama	19	5
Florida	8	1
Georgia	57	21
Kentucky	4	....
Louisiana	4	3
Mississippi	5	2
North Carolina	27	7
South Carolina	20	11
Tennessee	10	5
Virginia	37	6

In a number of the above states there are only one or two factories that make acid for their own use, while in others, one or two establishments manufacture such a large proportion of the sulphuric acid that it would be impossible to give you the totals for the state without disclosing the operations of some individual factories.

At the time of making reports, each manufacturer was assured that the information would be considered as confidential and that no publication would be made whereby the report of any establishment could be identified. While under these conditions, it is impossible for me to give you the total for each state, I can furnish the total quantity for the ten states. The 191 fertilizer factories reported the purchase of 46,018 tons of sulphuric acid and the manufacture of 489,213 tons for their own use. Possibly these totals will be of assistance to you.

The latest information compiled by the Bureau of the Census concerning the mining of phosphate is contained in the Census of Mines and Quarries of 1902, and I send you a copy of this report in connection with Bulletin No. 57. You can probably obtain later statistics for the phosphate industry by applying to Hon. Charles D. Walcott, Director of the United States Geological Survey, Washington, D. C.

Very respectfully,

W. S. ROSSITER,
Acting Director.

Separate inclosures.